Interstate 15 Corridor Improvement Project

Qualitative PM10 and PM2.5 Hot Spot Analysis

Riverside County, California

DISTRICT 8 – RIV – 15 (PM 8.74/52.28)

EA 0J0800

June 2011

Table of Contents

Tables and Figures

Chapter 1 Introduction

The Riverside County Transportation Commission (RCTC), in cooperation with the California Department of Transportation (Department) District 8, proposes to improve Interstate (I-) 15 from just north of the I-15/I-215 junction in the City of Murrieta (in Riverside County), northward to the San Bernardino County line. The purpose of the proposed project is intended to improve both existing and future mobility, reduce congestion, and improve mainline merge and diverge movements along I-15 within Riverside County. The total length of the project is approximately 43.5 miles and traverses the cities of Murrieta, Wildomar, Lake Elsinore, Corona, and Norco and portions of unincorporated Riverside County.

The proposed project is included in the Southern California Association of Governments' (SCAG's) 2011 Federal Transportation Improvement Plan (FTIP) under project number RIV071267, which was found to be conforming by FHWA on December 14, 2010[1]. As such, the proposed project's operational-period emissions (which include the ozone [O_3] precursors reactive organic gases [ROG] and oxides of nitrogen [NO_X]) meet the regional transportation conformity requirements imposed by the U.S. Environmental Protection Agency (EPA) and the South Coast Air Quality Management District (SCAQMD). Therefore, the proposed project must undergo a project-level air quality analysis, but not a regional conformity-level air quality analysis.

This project-level particulate matter impact hot spot analysis for the I-15 Corridor Improvement Project responds to the EPA's requirement for a hot spot analysis for particulate matter of diameter less than or equal to 2.5 microns (PM2.5), as required in the EPA's March 10, 2006 Final Transportation Conformity Rule (71 FR 12468). The effects of localized PM2.5 hot spots were evaluated using the EPA and FHWA's guidance manual, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration, and U.S. Environmental Protection Agency 2006).[2] This qualitative PM hotspot analysis demonstrates how the proposed project meets project-level PM conformity requirements for PM_{10} and $PM_{2.5}$.

[1] Project described in Final 2011 FTIP as "I-15 – SBD CO Line to Jct 1-15/I-215: Construct 4 HOT Lns (2 HOT lns in ea dir) from SBD Co line to Hidden Valley Pkwy and from Cajalco Rd to SR-74; cons 2 mf lns (1 ln ea dir from SBD co line to SR-74); cons 2 HOT lns (1 hot ln ea dir) from Hidden Valley Pkwy to Cajalco Rd; cons 2 HOV lns (1 ln ea dir) from SR74 to JCT I-15/I-205 (PA&ED only)."

[2] The availability of new EPA guidance documents was announced in the Federal Register on December 20, 2010, (75 FR 79370) for completing quantitative particulate matter ($PM_{2.5}$ and PM_{10}) hot-spot analyses. The announcement also provided for a 2-year grace period before use of the new quantitative PM hot-spot guidance is required for project-level PM conformity determinations. Until December 20, 2012, project-level conformity determinations made using the 2006 qualitative guidance remain appropriate.

Chapter 2 Project Location and Description

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purposes, while avoiding or minimizing environmental impacts. The alternatives include two Build Alternatives and the No-Build Alternative.

RCTC, in cooperation with the Department District 8, proposes to improve I-15 from just north of the I-15/I-215 junction in the City of Murrieta (in Riverside County), northward to the San Bernardino County line. The total length of the project is approximately 43.5 miles and traverses the cities of Murrieta, Wildomar, Lake Elsinore, Corona, and Norco and portions of unincorporated Riverside County. A project vicinity map is provided as Figure 2-1, and a Project Location Map is provided as Figure 2-2.

2.1 Build Alternatives

The I-15 Corridor Improvement Project is evaluating two build alternatives in addition to the No-Build Alternative. The build alternatives are as follows:

Build Alternative 1 would:

- Add (in each direction) between I-215 and SR-74 one high-occupancy-vehicle (HOV) lane;
- Add (in each direction) between SR-74 and SR-60:
  - One mixed-flow (MF) lane and
  - One HOV lane;
- Add auxiliary lanes at needed locations; and

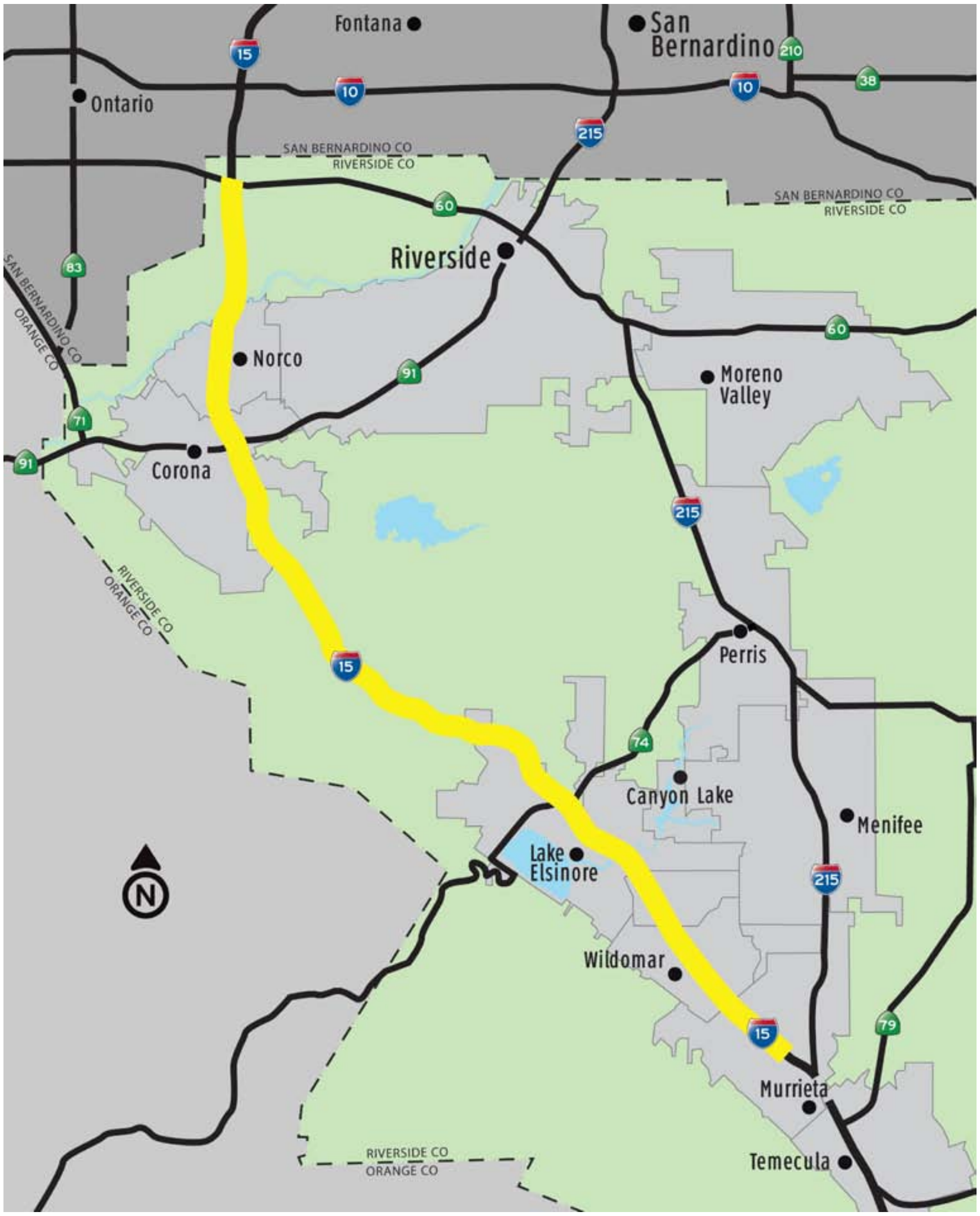
No new connections or ramps would be added as part of this alternative.

Build Alternative 2 would:

- Add (in each direction) between I-215 and SR-74 one HOV lane;
- Add (in each direction) between SR-74 and SR-60:
  - One mixed-flow lane and
  - Two tolled express (HOT) lanes;
- Add auxiliary lanes at needed locations

No new connections or ramps would be added as part of this alternative.

Figure 2-1 Project Vicinity



HDR 2010

Figure 2-2 Project Location

HDR 2010

Additionally, each build alternative would include additional project components such as retaining walls, sound walls, storm water runoff treatment devices, and bridge widenings, replacements, and reconstructions to accommodate the new auxiliary lanes and HOV or tolled express lanes. Permanent right-of-way acquisitions would be needed to accommodate the improvements, and temporary construction easements would be required to stage construction equipment, build components of the facility, and/or access some areas. The layouts and typical cross sections of the proposed freeway under Build Alternative 1 and Build Alternative 2 are illustrated in Figures 2-3a and 2-3b and Figure 2-4, respectively.

Due to 43.5-mile project limits, figure sizes are extremely large (i.e., ninety-three (93) 11 by 17 pages each for Figure 2-3a and Figure 2-3b, and nine (9) pages for Figure 2-4). As such, these figures are not included as part of this document. If interested in reviewing figures, please contact ICF International to arrange for FTP access or CD delivery.

- *Primary contact: Keith Cooper (KCooper@icfi.com), 213-627-5376*
- *Alternate Contact: Mari Piantka (MPiantka@icfi.com), 949-333-6615*

2.2 No Build Alternative

The No-Build Alternative would maintain the existing lanes on the I-15as they exist today. This alternative does not preclude the construction of future improvements or general maintenance to improve the operation of the facility or incorporate safety enhancements. The projected growth and development forecasts indicate that traffic volumes will increase along the corridor. Without the additional proposed capacity and operational improvements, the increased traffic demand would increase traffic congestion, leading to a degraded level of service (LOS) and an increase in delays and would have substantial adverse impacts on the environment and the community. As a result, the No-Build Alternative is not consistent with the project need and purpose and the I-15 Route Concept Report (RCR). The No-Build Alternative provides a baseline for comparing the impacts with the other build alternatives. It is used to compare the relative impacts and benefits of the proposed project improvements, but would not meet the identified purpose and need.

Chapter 3 PM10 and PM2.5 Hot Spot Analysis

The following is the I-15 Corridor Improvement Project hot spot conformity analysis for particulate matter less than or equal to 10 microns in diameter (PM10) and particulate matter less than or equal to 2.5 microns in diameter (PM2.5). In accordance with the final Transportation Conformity Rule, 40 CFR 93.116 and 93.123 (b)(1), this project is defined as a Project of Local Air Quality Concern (PLAQC) and requires a qualitative PM2.5 and PM10 hot spot analysis..

3.1 Regulatory Background

Under 1990 Clean Air Act Amendments, the U.S. Department of Transportation (DOT) cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide ($NO_{2)}$, ozone ($O_{3)}$, and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTPs) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments (SCAG) for Riverside County and the appropriate federal agencies, such as the Federal Highway Administration (FHWA), make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

The concept of transportation conformity was introduced in the CAA 1977 amendments. Transportation conformity requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to new air quality violations of the NAAQS. Conformity requirements were made substantially more rigorous in the 1990 CAAA, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993.

DOT and the EPA developed guidance for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (*40 Code of Federal Regulations* [*CFR*] *51* and *40 CFR 93*). The demonstration of conformity to the SIP is the responsibility of the local Metropolitan Planning Organization (MPO), which is also responsible for preparing RTPs and associated demonstration of SIP conformity. Section 93.114 of the Transportation Conformity Rule, states that "there must be a currently conforming regional transportation plan and transportation improvement plan at the time of project approval."

The SCAG is the designated federal MPO and state regional transportation planning agency for Riverside County. As such, SCAG coordinates the region's major transportation projects and programs, and promotes regionalism in transportation investment decisions.

3.1.1 Statutory Requirements for PM Hotspot Analyses

On March 10, 2006, the EPA issued a final transportation conformity rule (40 CFR 51.390 and Part 93) that addresses local air quality impacts in PM10 and PM2.5 nonattainment and maintenance areas. The final rule requires a hot spot analysis to be performed for a PLAQC or any other project identified by the PM2.5 and PM10 SIP as a localized air quality concern. Transportation conformity, under CAA section 176(c) (42 U.S.C. 7506(c)), requires that federally supported highway and transportation project activities conform to the State Implementation Plan (SIP). The rule provides criteria and procedures to ensure that these activities will not cause or contribute to new violations, increase the frequency or severity of any existing violations, or delay timely attainment of the relevant NAAQS as described in 40 CFR 93.101.

EPA's final rule, 40 CFR 93.123(b)(1) defines a PLAQC as:

> (i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
>
> (ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
>
> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM2.5 or PM10 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

In March 2006, the FHWA and EPA issued a guidance document entitled *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to cause or contribute to new air quality violations, increase the frequency or severity of existing violations, or delay timely attainment of NAAQS for PM2.5 or PM10. The PM2.5 and PM10 hot spot analyses are required for project-level conformity because the area is in non-attainment for both PM 2.5 and PM10 standards.

For the assessment of PM2.5 and PM10 hotspots, the final rule is that a hotspot analysis is to be performed only for PLAQCs. PLAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a localized air quality concern. The following list provides examples of PLAQCs.

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8% or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operated at LOS D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

The list below provides examples of projects that are not of local air quality concern.

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E, or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen PM2.5 or PM10 violations.
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed

to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on PM2.5 or PM10 emissions.

For projects identified as not being a PLAQC, qualitative PM2.5 and PM10 (for regions without an approved conformity SIP) hotspot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that CAA and *40 CFR 93.116* requirements were met without a hotspot analysis, since such projects have been found to not be of local air quality concern under *40 CFR 93.123(b)(1).* Because this analysis assumes the area is classified as a nonattainment area for the federal PM2.5 and PM 10 standard, a determination must be made as to whether it would result in a PM2.5 or PM10 hotspot.

Of these five PLAQC types identified above, the project most likely falls into the first category of a "new or expanded highway projects that have a significant number of or significant increase in diesel vehicles." As indicated in Table 3-1, traffic volumes along I-15 are anticipated to exceed the EPA and FHWA's PLAQC guidelines of 125,000, and truck percentages for multiple scenarios are expected to exceed the PLAQC guidelines of 8% (i.e., 10,000 truck ADT). Consequently, the project is considered to be a PLAQC and qualitative project-level PM2.5 and PM10 hot spot analyses, consistent with FHWA and EPA's 2006 qualitative hot spot analysis guidance, were conducted to assess whether the project would cause or contribute to any new localized PM2.5 or PM10 violations; or increase the frequency or severity of any existing violations; or delay timely attainment of the PM10 or PM2.5 national ambient air quality standards (NAAQS).

Table 3-1. I-15 Mainline ADT Volume Calculation Assumptions

	Existing (2007)[1]		2020						2040					
			No Build[2]		Alternative 1[3]		Alternative 2[4]		No Build[5]		Alternative 1[6]		Alternative 2[7]	
Interstate 15	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
Between Murrieta Hot Springs Rd & I-215	109,000	9,925	104,449	10,338	112,965	10,506	110,817	10,348	160,363	16,870	170,834	16,552	170,705	16,784
At Murrieta Hot Springs Rd	100,113	9,116	100,189	9,916	108,904	10,129	107,132	10,004	152,149	16,006	167,695	16,248	163,129	16,039
Between Kalmia St/California Oaks Rd & Murrieta Hot Springs Rd	127,000	11,564	119,552	11,833	129,637	12,057	126,849	11,845	176,467	18,564	193,947	18,791	189,541	18,636
At Kalmia St/California Oaks Rd	106,000	9,652	103,479	10,242	113,471	10,553	111,019	10,367	154,366	16,239	171,409	16,608	166,201	16,341
Between Clinton Keith Rd & Kalmia St/California Oaks Rd	124,000	11,291	111,957	11,081	122,787	11,420	119,868	11,193	164,056	17,259	183,361	17,766	177,013	17,404
At Clinton Keith Rd	105,000	9,561	99,063	9,805	109,719	10,204	106,897	9,982	143,485	15,095	161,846	15,681	156,119	15,350
Between Baxter Rd & Clinton Keith Rd	123,000	11,200	115,376	11,419	127,591	11,867	124,208	11,599	166,056	17,469	187,140	18,132	180,788	17,776
At Baxter Rd	114,749	10,449	106,499	10,541	118,696	11,039	114,963	10,735	154,664	16,271	173,056	16,767	171,828	16,895
Between Bundy Canyon Rd & Baxter Rd	118,000	10,745	110,220	10,909	124,286	11,559	119,133	11,125	158,425	16,666	177,394	17,188	175,418	17,248
At Bundy Canyon Rd	103,375	9,413	101,117	10,008	114,671	10,665	109,214	10,198	139,655	14,692	160,488	15,550	154,891	15,229
Between Olive St & Bundy Canyon Rd	113,000	10,290	109,819	10,869	124,119	11,544	117,635	10,985	148,157	15,586	171,079	16,576	166,163	16,338
At Olive St	113,000	10,290	99,562	9,854	117,253	10,905	111,479	10,410	139,532	14,679	167,030	16,183	161,949	15,923
Between Railroad Canyon Rd & Olive St	113,000	10,290	109,648	10,852	126,981	11,810	119,897	11,196	148,959	15,670	181,158	17,552	174,998	17,206
At Railroad Canyon Rd	95,700	8,714	104,988	10,391	118,993	11,067	113,520	10,601	144,323	15,183	172,955	16,757	166,361	16,357
Between Franklin St & Railroad Canyon Rd	122,000	11,109	115,102	11,392	130,260	12,115	127,504	11,906	154,566	16,260	186,081	18,029	177,116	17,415
At Franklin St	122,000	11,109	112,230	11,108	127,364	11,845	124,602	11,635	150,602	15,843	179,630	17,404	171,437	16,856
Between Main St & Franklin St	122,000	11,109	118,040	11,683	135,630	12,614	131,899	12,317	165,449	17,405	188,162	18,231	179,848	17,683
At Main St	113,700	10,353	111,995	11,085	129,509	12,045	125,961	11,762	156,701	16,485	178,384	17,283	170,947	16,808
Central Ave (SR-74) On Ramp to Main St Off Ramp	119,000	10,836	124,360	12,308	137,732	12,810	134,226	12,534	169,181	17,798	189,957	18,405	186,050	18,293
At Central Ave (SR-74)	94,441	8,600	107,951	10,684	121,491	11,299	119,336	11,144	148,350	15,606	168,367	16,313	166,802	16,400
Between Nichols Rd & Central Ave (SR-74)	107,000	9,743	121,529	12,028	139,706	12,993	135,780	12,679	158,148	16,637	182,374	17,670	181,577	17,853
At Nichols Rd	101,856	9,275	113,079	11,192	135,179	12,572	131,913	12,318	152,213	16,013	176,027	17,055	177,695	17,471
Between Lake St & Nichols Rd	109,000	9,925	118,361	11,715	142,423	13,246	138,408	12,925	155,802	16,390	182,077	17,641	183,864	18,078
At Lake St	102,200	9,306	115,401	11,422	135,027	12,558	131,797	12,307	149,812	15,760	175,782	17,031	176,035	17,308
Between Horsethief Canyon Rd & Lake St	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	166,600	17,526	193,531	18,751	194,602	19,134
At Horsethief Canyon Rd	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	159,139	16,741	189,954	18,404	189,441	18,626

Interstate 15	Existing (2007)[1]		2020 No Build[2]		2020 Alternative 1[3]		2020 Alternative 2[4]		2040 No Build[5]		2040 Alternative 1[6]		2040 Alternative 2[7]	
	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
Indian Truck Trail Rd On Ramp to Horsethief Canyon Rd	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	173,276	18,229	204,261	19,791	202,353	19,896
At Indian Truck Trail Rd	111,400	10,144	130,181	12,885	151,297	14,071	146,339	13,665	169,044	17,783	201,409	19,514	198,901	19,556
Between Temescal Canyon Rd & Indian Truck Trail Rd	121,000	11,018	141,523	14,007	162,467	15,110	155,139	14,487	180,841	19,024	212,646	20,603	210,010	20,649
At Temescal Canyon Rd	114,400	10,417	132,373	13,102	157,206	14,621	148,748	13,890	166,619	17,528	203,796	19,746	199,925	19,657
Between Weirick Rd & Temescal Canyon Rd	131,000	11,929	138,891	13,747	160,921	14,966	156,151	14,581	181,571	19,101	215,474	20,877	211,849	20,830
At Weirick Rd	128,127	11,667	131,862	13,051	157,824	14,678	153,165	14,303	174,473	18,355	211,064	20,450	209,869	20,635
Between Cajalco Rd & Weirick Rd	146,000	13,294	137,800	13,639	164,860	15,333	161,823	15,111	180,363	18,974	213,855	20,720	211,279	20,774
At Cajalco Rd	136,300	12,411	135,088	13,370	162,205	15,086	159,042	14,851	173,526	18,255	207,393	20,094	205,543	20,210
Between El Cerrito Rd & Cajalco Rd	155,000	14,114	156,817	15,521	185,073	17,213	184,335	17,213	260,739	27,430	302,986	29,356	296,907	29,193
At El Cerrito Rd	149,260	13,591	150,986	14,944	176,957	16,458	176,055	16,440	260,739	27,430	302,986	29,356	296,907	29,193
Between Ontario Ave & El Cerrito Rd	160,000	14,569	174,470	17,268	191,683	17,827	195,452	18,251	285,812	30,067	330,228	31,995	325,094	31,964
At Ontario Ave	139,726	12,723	168,386	16,666	193,764	18,021	186,658	17,430	269,907	28,394	310,461	30,080	303,457	29,837
Between Magnolia Ave & Ontario Ave	160,000	14,569	180,766	17,891	208,247	19,368	203,043	18,960	265,826	27,965	304,790	29,531	298,599	29,359
At Magnolia Ave	139,037	12,660	168,832	16,710	193,888	18,032	189,042	17,653	247,605	26,048	286,039	27,714	278,650	27,398
Between SR-91 & Magnolia Ave	174,000	15,844	201,851	19,978	218,707	20,341	223,140	20,837	282,758	29,746	303,673	29,423	315,455	31,016
At SR-91	71,957	6,552	90,349	8,942	112,281	10,443	110,681	10,335	139,870	14,714	179,214	17,364	173,158	17,025
Between Hidden Valley Pkwy & SR-91	157,000	14,296	167,692	16,597	205,090	19,074	202,716	18,930	234,928	24,714	297,925	28,866	284,174	27,941
At Hidden Valley Pkwy	134,385	12,237	144,403	14,292	181,014	16,835	184,850	17,261	201,555	21,204	268,295	25,995	254,653	25,038
Second St & Hidden Valley Pkwy	156,000	14,205	169,777	16,804	208,551	19,396	207,118	19,341	230,011	24,197	295,080	28,590	287,791	28,296
At Second St	141,881	12,919	149,013	14,748	188,434	17,525	187,367	17,496	204,502	21,514	269,373	26,099	266,150	26,169
Between Sixth St & Second St	150,000	13,659	166,231	16,453	208,297	19,373	204,033	19,053	219,833	23,126	289,372	28,037	284,789	28,001
At Sixth St	132,200	12,038	157,158	15,555	196,794	18,303	194,851	18,195	204,324	21,495	273,192	26,469	266,941	26,246
Between Schleisman Rd & Sixth St	150,000	13,659	177,306	17,549	218,233	20,297	212,817	19,873	225,272	23,699	297,607	28,835	290,395	28,552
At Schleisman Rd	150,000	13,659	163,451	16,177	205,287	19,093	199,438	18,624	205,581	21,627	275,082	26,652	268,235	26,374
Between Limonite Ave & Schleisman Rd	150,000	13,659	171,337	16,958	212,393	19,753	209,834	19,594	221,522	23,304	297,537	28,828	287,373	28,255
At Limonite Ave	126,988	11,563	149,243	14,771	192,455	17,899	192,404	17,967	193,047	20,309	264,965	25,672	257,641	25,332
Between Cantu-Galleano Ranch Rd & Limonite Ave Off Ramp	150,000	13,659	171,161	16,941	216,303	20,117	215,907	20,161	229,140	24,106	302,850	29,343	294,647	28,970

Interstate 15	Existing (2007)[1]		2020 No Build[2]		2020 Alternative 1[3]		2020 Alternative 2[4]		2040 No Build[5]		2040 Alternative 1[6]		2040 Alternative 2[7]	
	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
At Cantu- Galleano Ranch Rd	138,819	12,641	162,896	16,123	204,465	19,016	207,165	19,345	220,692	23,217	283,977	27,514	281,080	27,637
Between SR-60 & Cantu-Galleano Ranch Rd	145,000	13,203	177,634	17,581	219,549	20,419	217,552	20,315	242,175	25,477	306,795	29,725	295,799	29,084
At SR-60	103,415	9,417	132,821	13,146	163,136	15,172	157,943	14,749	187,819	19,759	236,088	22,874	223,648	21,990
Between Jurupa St & SR60	14,000	1,275	229,050	22,670	255,364	23,750	247,246	23,088	312,113	32,834	356,015	34,494	340,160	33,445

[1] Truck percentage under existing conditions is 9.11%, based on data provided by the project engineers (Iteris. Greene pers. comm., 2011 compiled by ICF International February 2011).

[2] Truck percentage under the 2020 No Build Alternative is 9.90%, based on data provided by the project engineers (Iteris. Greene pers. comm., 2011 compiled by ICF International February 2011).

[3] Truck percentage under 2020 Alternative 1 is 9.30%, based on data provided by the project engineers.

[4] 9.34% Truck percentage under 2020 Alternative 2 is based on data provided by the project engineers.

[5] 10.52%, Truck percentage under the 2040 No Build Alternative is 10.52%, based on data provided by the project engineers.

[6] Truck percentage under 2040 Alternative 1 is 9.69%, based on data provided by the project engineers.

[7] Truck percentage under 2040 Alternative 2 is 9.83%, based on data provided by the project engineers.

3.1.2 National Ambient Air Quality Standards

PM2.5 NAAQS:

- **24-hour Standard:** The old 1997 standard of 65 µg/m^3 was revised in 2006 to 35 µg/m^3
- **Annual Standard:** 15 µg/m^3

PM10 NAAQS:

- **24-hour Standard:** 150 µg/m^3

The (SCAB), the basin in which Riverside County resides, was designated as a serious nonattainment area from its previous designation of moderate nonattainment area for the federal PM10 standard on February 8, 1993. The SCAB was classified as a nonattainment area on April 5, 2005 for the federal PM2.5 standard. (South Coast Air Quality Management District 2003 & South Coast Air Quality Management District 2007.)

The 24-hour PM10 standard is based on the number of days in the calendar year with 24-hour recorded concentrations greater than 150µg/m^3; the number of days must be equal to or less than one. The annual PM10 standard is no longer used for determining federal attainment status. The 24-hour PM2.5 standard is based on 3-year average of the 98th percentile of 24-hour recorded concentrations; the annual standard is based on 3-year average of the annual arithmetic mean PM2.5 recorded concentrations. A PM2.5 hot-spot analysis must consider both standards, unless it is determined for a given area that meeting the controlling standard would ensure that CAA requirements are met for both standards. The interagency consultation process should be used to discuss how the qualitative PM2.5 hot-spot analysis meets statutory and regulatory requirements for both standards, depending on the factors that are evaluated for a given project.

3.2 Hot Spot Analysis

The final Transportation Conformity Rule requires a hot spot analysis to be performed for PLAQC, while projects identified as not being a PLAQC are not required to undergo a hot spot analysis. As indicated above, data from Table 3-1 indicates that the project is a PLAQC based on roadway traffic and truck ADT, and a qualitative PM2.5 and PM10 hot spot analysis consistent with FHWA and EPA’s 2006 qualitative hot spot analysis guidance is required.

A hot-spot analysis is defined in Section 93.101 of 40 CFR as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot-spot analysis assesses the air quality impacts on a project-level – a scale smaller than an entire nonattainment or maintenance area, such as for congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets the federal CAA conformity requirements to support state and local air quality goals with respect to achieving the attainment status in a timely manner. When a hot-spot analysis is required, it is included within the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

3.2.1 Analysis Methodology and Types of Emissions Considered

The EPA and FHWA established in the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006) the following two methods for completing a PM2.5 and PM10 hot-spot analysis:

1. Comparison to another location with similar characteristics – (pollutant trend within the air basin)
2. Air quality studies for the proposed project location – (ambient PM trend analysis in the project area)

This analysis uses a combined approach to demonstrate that the proposed project would not result in a new or worsened PM2.5 or PM10 violation. Method 1 was used to establish that the proposed project area will meet the NAAQS. Method 2 was used to demonstrate that implementation of the proposed project would not delay attainment of the NAAQS.

The analysis was based on directly emitted PM2.5 and PM10 emissions, including tailpipe, brake wear, and tire wear. Re-entrained road dust is also included in the qualitative analysis, as PM10 re-entrained dust must be considered per conformity requirements and PM2.5 re-entrained road dust must be considered because the California Air Resources Board (ARB) has determined that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the region (South Coast Air Quality Management District 2007).

Secondary particles formed through PM2.5 and PM10 precursor emissions from a transportation project take several hours to form in the atmosphere, giving emissions time to disperse beyond the immediate project area of concern for localized analyses; therefore, they were not considered in this hot-spot analysis. Secondary emissions of PM2.5 and PM10 are considered as part of the regional emission analysis prepared for the conforming RTP and Federal Transportation Improvement Program (FTIP).

No phase of construction is anticipated to last more than 5 years at any one location. In addition, the project must comply with South Coast Air Quality Management District (SCAQMD) construction-related fugitive dust control measures (Rule 403), which will ensure that fugitive dust from construction activities are minimized. Consequently, construction-related PM2.5 and PM10 emissions were not included in the hot spot analysis per 40 CFR 93123(c)(5).

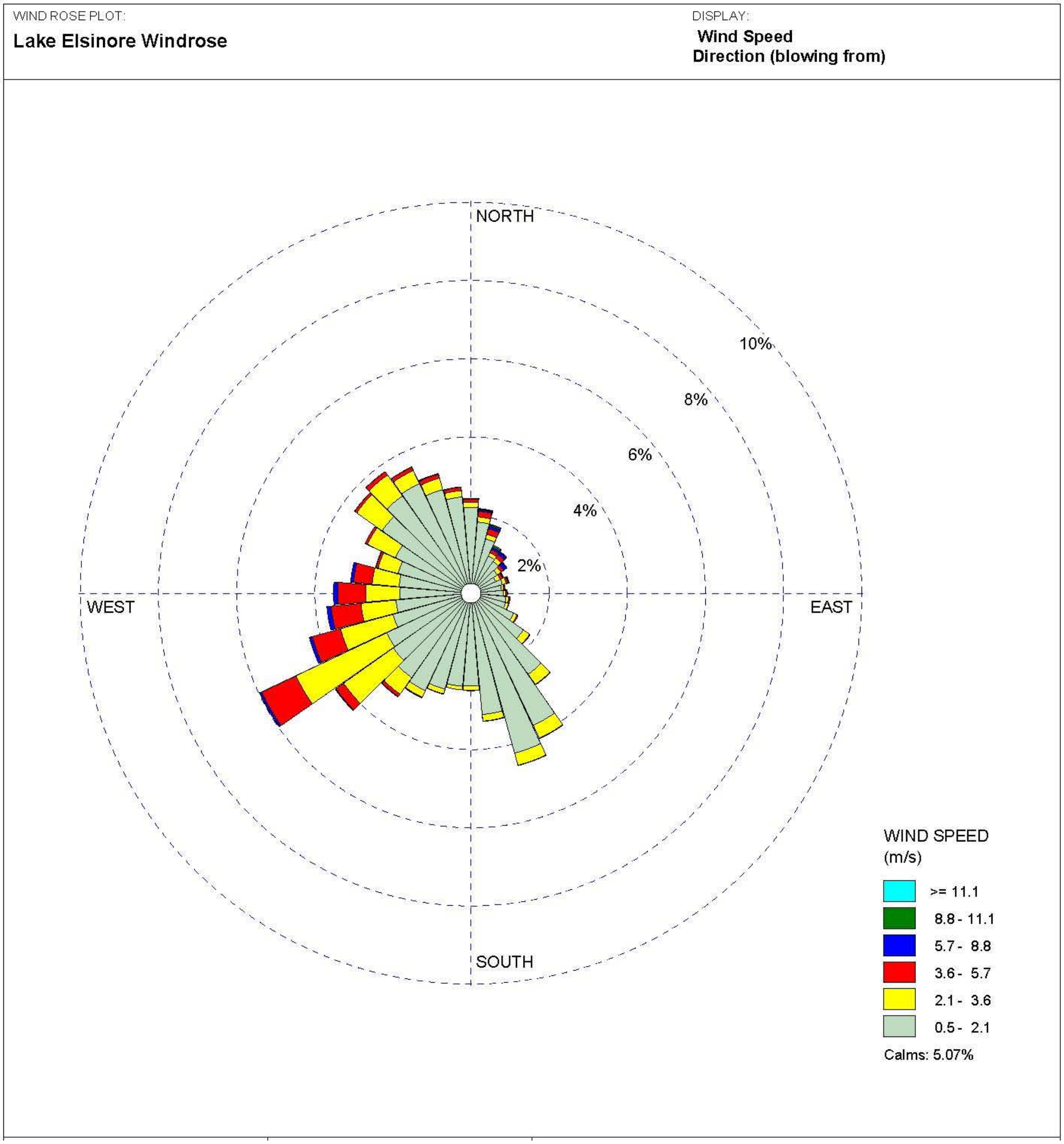
3.2.2 Air Quality Trend Analysis

Local air quality data was obtained from 4 monitoring stations: Mira Loma-Van Buren, Lake Elsinore, Norco, and Riverside. Air quality monitoring data is measured at Mira Loma-Van Buren, Lake Elsinore and Norco, while meteorological data is measured at Lake Elsinore, Norco and Riverside. The Mira Loma-Van Buren station is located at the Northeastern end of the project corridor, the Lake Elsinore station is located at the Southern end of the corridor, and the Riverside station is located at the Northeastern end of the corridor. The Norco station is located at the Northern end of the project corridor and is the nearest wind monitoring station. Data from the Lake Elsinore, Norco and Riverside monitoring stations have been included to characterize wind patterns in the project area. In addition to monitoring data, this analysis presents project-level PM2.5 and PM10 emissions in the future (2020 and 2040) years to help characterize the project's impact on total PM emissions generated in the project area and the impacts of the project and the likelihood of these impacts interacting with the ambient PM levels to cause PM hot spots.

3.2.2.1 Climate and Topography

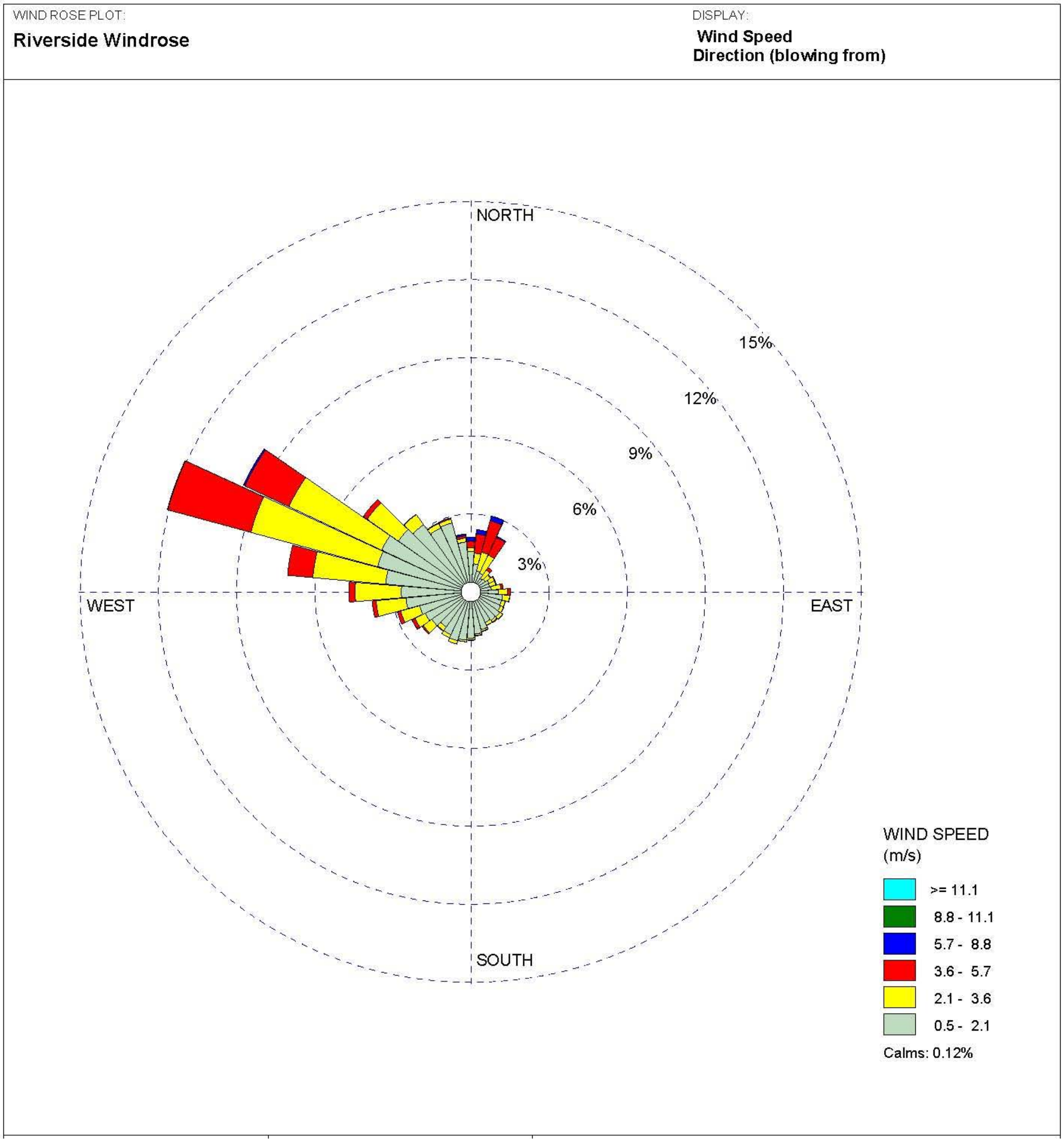
The proposed project lies within the 6,745 square mile SCAB. The SCAB is bounded by the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east and the Pacific Ocean to the West. The light winds and shallow vertical atmospheric mixing characteristic to the SCAB are present due to the region's terrain and geographical features. These characteristics contribute to the severity of air pollution issues in the SCAB. Figures 3-1 through 3-3 indicate the predominant wind direction in the regionbased on meteorological data from the Lake Elsinore, Norco and Riverside monitoring stations discussed above. (South Coast Air Quality Management District 2009a and b).

Figure 3-1. Predominant Wind Direction at Lake Elsinore Station



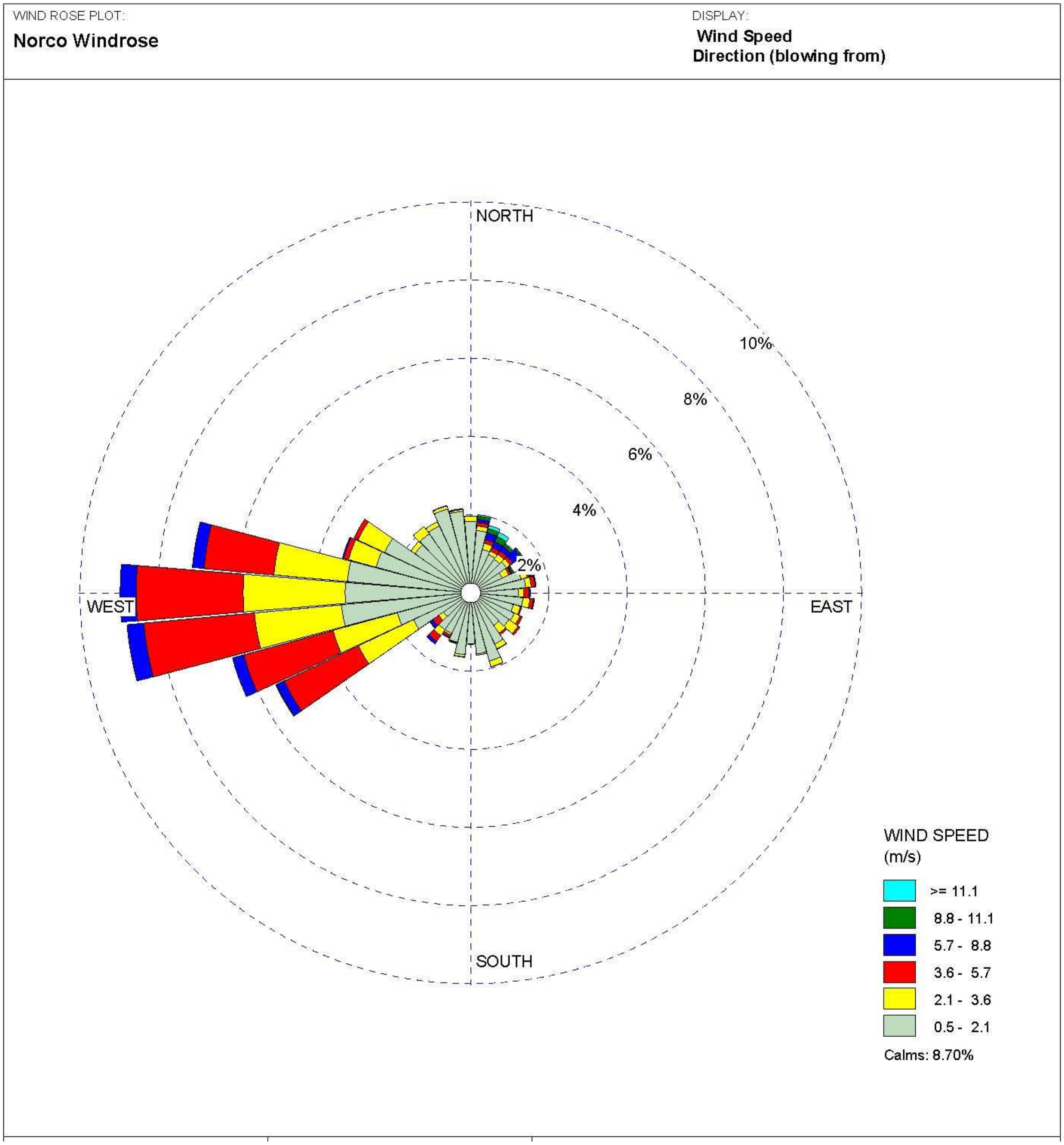
Source: South Coast Air Quality Management District 2009b

Figure 3-2. Predominant Wind Direction at Riverside Station



Source: South Coast Air Quality Management District 2009a

Figure 3-3. Predominant Wind Direction at Norco Station



Source: South Coast Air Quality Management District 2009b

3.2.2.2 Trends in Monitored Particulate Matter Concentrations

As required by the applicable transportation conformity regulations for PM, a trend analysis has been conducted and compared to the NAAQS.

PM2.5

Monitored PM2.5 concentrations for the Lake Elsinore and Mira Loma Van Buren monitoring stations are presented in Table 3-2. Monitored PM2.5 data is not collected at the Norco monitoring station. Monitored data presented in Table 3-2 is for the three-year period from 2007 to 2009, the last year which complete data is available.

Table 3-2 Ambient PM2.5 Monitoring Data ($\mu g/m^3$) at the Lake Elsinore and Mira Loma Van Buren Monitoring Stations (2007-2009)

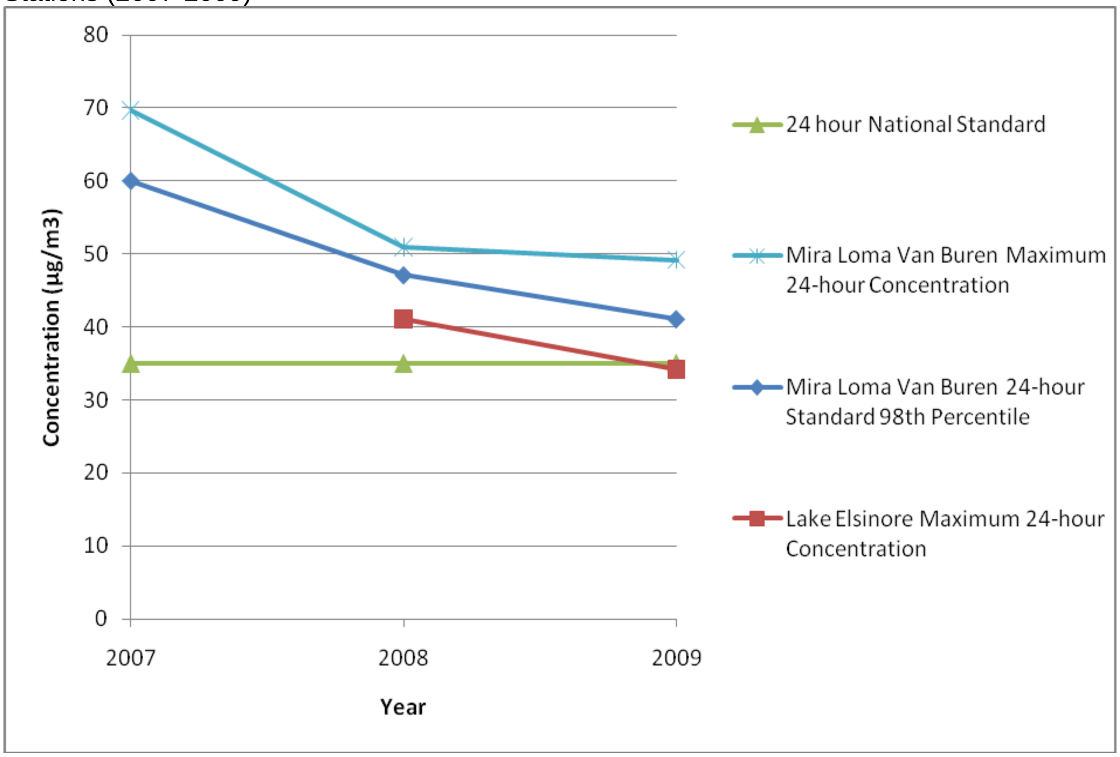
Metric	**2007**	**2008**	**2009**
Lake Elsinore			
Maximum 24-Hour Concentration	NA	41.1	34.2
Exceeds the federal 24-hour standard (35 $\mu g/m^3$)?	NA	Yes	No
National annual average	NA	NA	NA
Exceeds the federal annual average standard (15 $\mu g/m^3$)?	NA	NA	NA
Mira Loma Van Buren			
Maximum 24-Hour Concentration	69.7	50.9	49.2
24-Hour Standard 98th Percentile	60	47.1	41.1
Exceeds the federal 24-hour standard (35 $\mu g/m^3$)?	Yes	Yes	Yes
National annual average	20.9	18.2	16.7
Exceeds the federal annual average standard (15 $\mu g/m^3$)?	Yes	Yes	Yes

Source: California Air Resources Board 2011, compiled by ICF International February 2011.

As indicated in Table 3-2 and Figure 3-6, maximum 24-hour PM2.5 concentrations at the Lake Elsinore monitoring station decreased from 41.1 $\mu g/m^3$ in 2008 to 34.2 $\mu g/m^3$ in 2009, the latter being under the national standard of 35 $\mu g/m^3$. Table 3-2 and Figure 3-6 also indicate that 24-hour concentrations at the Mira Loma Van Buren monitoring station decreased decrease between 2007 (69.7 $\mu g/m^3$) and 2009 (49.2 $\mu g/m^{3).}$ These values have remained above the current national standard of 35 $\mu g/m^3$, are below the old 24hour PM2.5 standard of 65 $\mu g/m^3$. While the national 24-hour PM2.5 standard has been exceeded at both stations in past years, Table 3-2 and Figure 3-

4 indicates there is a clear downward trend in emissions. The Lake Elsinore station has experienced decreasing emissions and measured concentrations below the PM2.5 standard in 2009, while concentrations at the Mira Loma Van Buren station have decreased significantly over the three year period. It is anticipated that concentrations should be below the 24-hour PM2.5 standard if the decreasing trend continues.

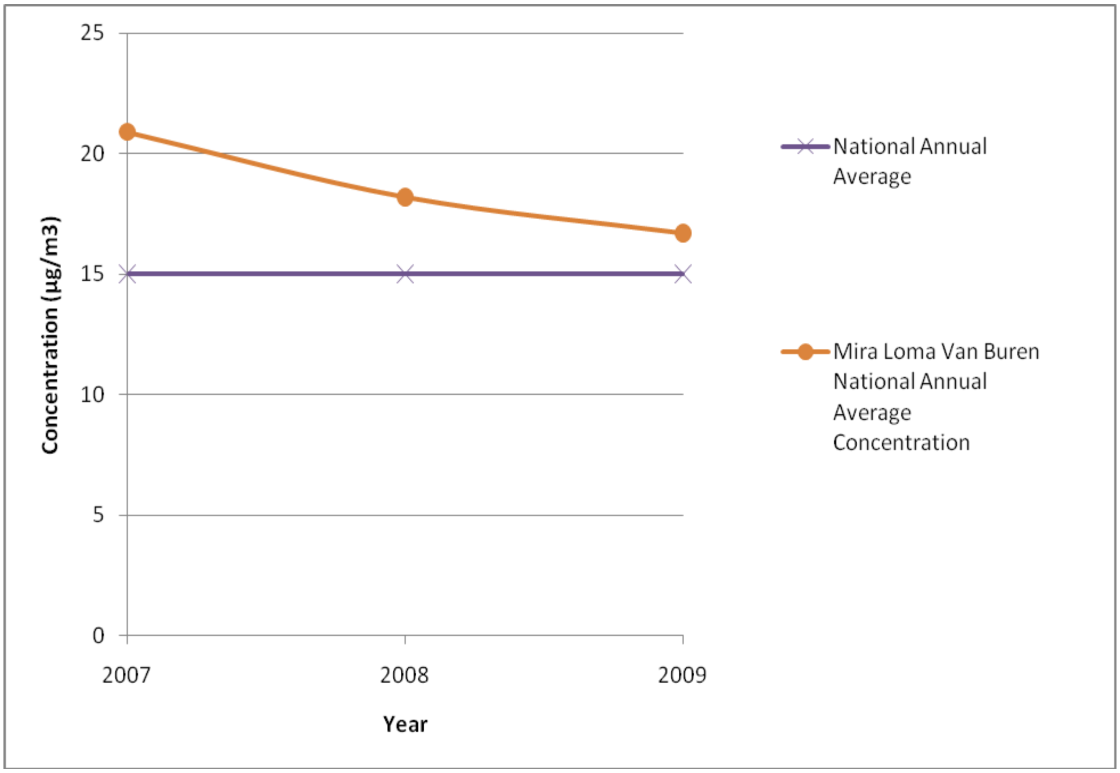
Figure 3-4. PM2.5 24-hour Concentrations (μg/m^3) at the Mira Loma Van Buren and Lake Elsinore Stations (2007-2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

Table 3-2 also presents national annual average PM2.5 data from the Mira Loma Van Buren station. As seen in Table 3-2 and Figure 3-5, monitored annual average PM2.5 values have decreased over the three year period from 20.9 $\mu g/m^3$ in 2007 to 16.7 $\mu g/m^3$ in 2009, nearing the 15 $\mu g/m^3$ national standard. While monitored values were above the 15 $\mu g/m^3$ standard in 2009, concentrations should be below the annual average PM2.5 standard if the trend continues.

Figure 3-5. PM2.5 Annual Average Concentration ($\mu g/m^3$) at the Mira Loma Van Buren Station. (2007 through 2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

PM10

Monitored PM10 concentrations for the Lake Elsinore, Mira Loma Van Buren, and Norco monitoring stations are presented in Table 3-3. Monitored data presented in Table 3-3 is for the three-year period from 2007 to 2009, the last year which complete data is available.

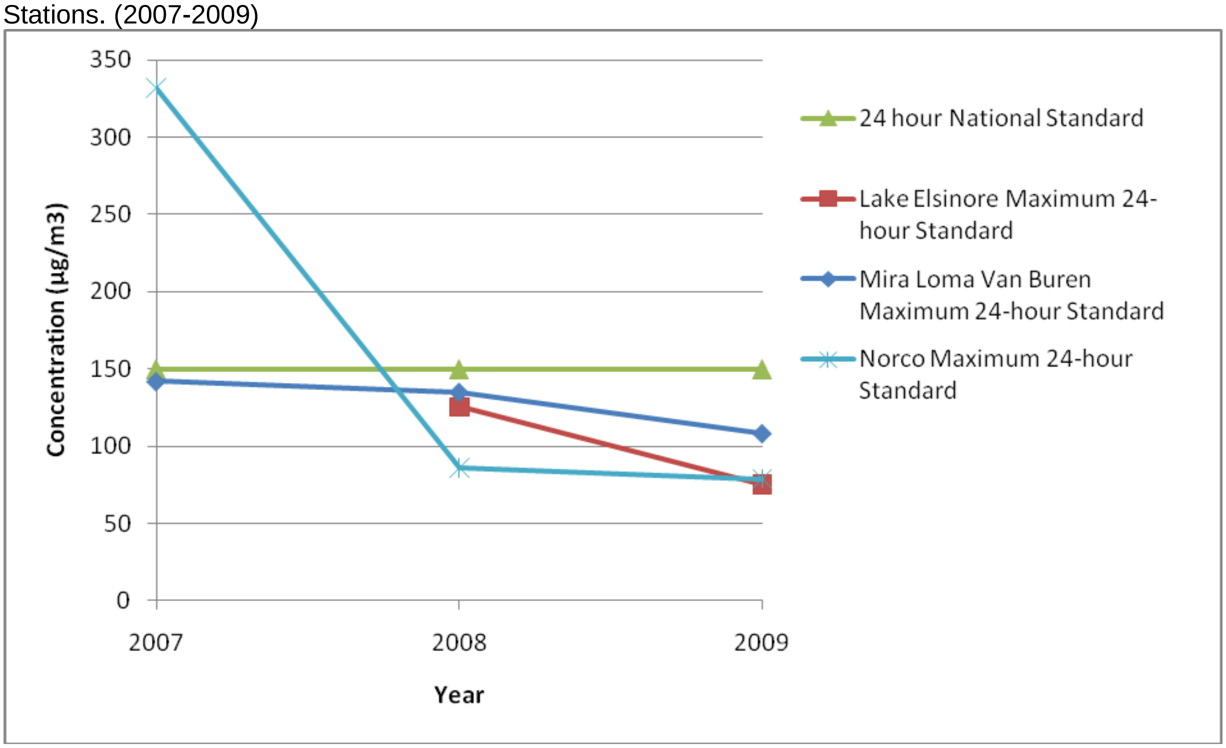
Table 3-3 Ambient PM10 Monitoring Data (μg/m^3) at the Lake Elsinore, Mira Loma Van Buren, and Norco Monitoring Stations (2007 through 2009)

	2007	**2008**	**2009**
Lake Elsinore			
Maximum 24-Hour Concentration	NA	125.4	75.2
Exceeds the federal 24-hour standard (150 μg/m^3)?	NA	No	No
Norco			
Maximum 24-Hour Concentration	332	86	79
Exceeds the federal 24-hour standard (150 μg/m^3)?	Yes	No	No
Mira Loma Van Buren			
Maximum 24-Hour Concentration	142	135	108
Exceeds the federal 24-hour standard (150 μg/m^3)?	No	No	No

Source: California Air Resources Board 2011, compiled by ICF International February 2011.

As indicated in Table 3-3 and Figure 3-6, maximum 24-hour PM10 concentrations at the Lake Elsinore monitoring station decreased from between 2008 (125.4 μg/m^3) and 2009 (75.2 μg/m^3) in 2009. These values have remained below the current national standard of 150 μg/m^3. At the Norco monitoring station, Table 3-3 and Figure 3-6 indicate that 24-hour PM10 concentrations have decreased from 332 μg/m^3 in 2007 to 79 μg/m^3 in 2009. The national 24 hour maximum measurement at the Norco station in 2007 is above the national standard due to wildfires and strong winds that occurred in the region (California Air Resources Board n.d.). The California Air Resources Board (ARB) has requested that 2007 data from the Norco monitoring station be excluded due to these exceptional events. It should be noted that the following year, 2008, at the Norco station, the maximum 24-hour PM10 concentration was measured at 86 μg/m^3, well below the standard of 150 μg/m^3. Table 3-3 and Figure 3-6 also indicate that 24-hour PM10 concentrations have decreased from 142 μg/m^3 in 2007 to 108 μg/m^3 in 2009 at the Mira Loma Van Buren Station.

Figure 3-6. PM10 24-hour Concentrations (μg/m^3) at the Mira Loma Van Buren, Lake Elisnore, and Norco Stations. (2007-2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

3.2.2.3 Surrounding Land Uses

The South Coast Air Quality Management District (SCAQMD) generally defines a sensitive receptor as a facility or land use that houses or attracts members of the population, such as children, the elderly, and people with illnesses, who are particularly sensitive to the effects of air pollutants.

Various sensitive receptors are located along the 43.5-mile project limits, and include residences, schools, playgrounds, child care facilities, athletic facilities, health care facilities, convalescent centers, or rehabilitation centers. Land use compatibility issues relative to the siting of pollution-emitting sources or the siting of sensitive receptors must be considered. In the case of schools, state law requires that siting decisions consider the potential for toxic or harmful air emissions in the surrounding area. The Northern section of the project vicinity, from SR-91 to the Northern end of the project corridor, is densely populated and contains a variety of sensitive receptors. The Southern section of the project vicinity is less densely populated than the Northern section.

3.2.2.4 Future Trends

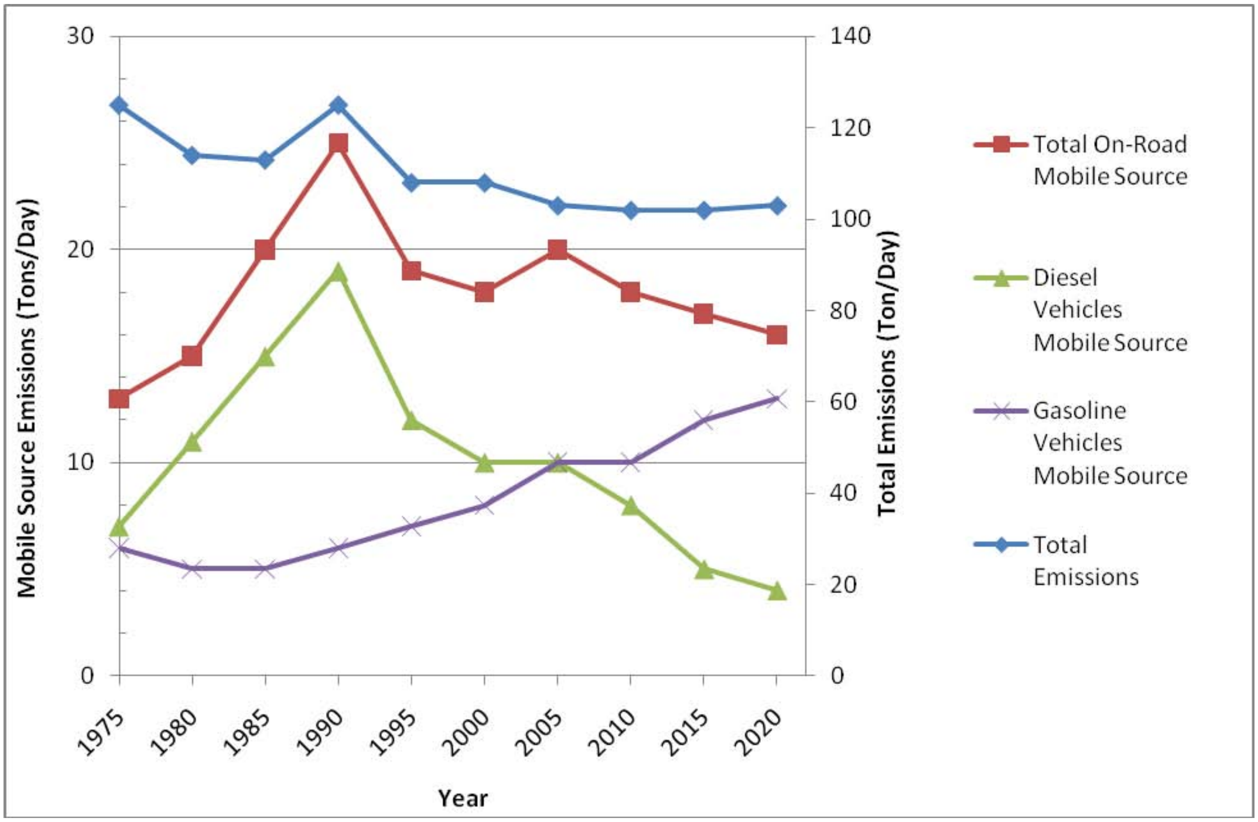
Emission trend data for the SCAB published in the 2009 edition of *The California Almanac of Emissions and Air Quality* published by the ARB was used to provide an estimate of potential PM2.5 and PM10 trends in the vicinity of the project area (California Air Resources Board 2009). While the ARB's Almanac does not provide emission trend data on the county level, the regional trend data can be used to provide insight on the general trends of air quality in the project area, as implementation of emission standards and control requirements that have an effect on regional pollutant concentrations are likely to result in similar trends at the local level.

Tables 3-4 and 3-5 and Figures 3-7 and 3-8 present emission trends in the SCAB for the years 1975-2020 based on ARB Almanac data (California Air Resources Board 2009). Total PM2.5 emissions, emissions from on-road gasoline vehicles, on-road diesel vehicles, and total on-road emissions are presented in Table 3-4 and Figure 3-7, while Table 3-5 and Figure 3-8 present the same emission trend categories for PM10.

Table 3-4. PM2.5 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	125	13	7	6
1980	114	15	11	5
1985	113	20	15	5
1990	125	25	19	6
1995	108	19	12	7
2000	108	18	10	8
2005	103	20	10	10
2010	102	18	8	10
2015	102	17	5	12
2020	103	16	4	13
Source: California Air Resources Board 2009				

Figure 3-7 PM2.5 Emission trends in South Coast Air Basin (tons per day)

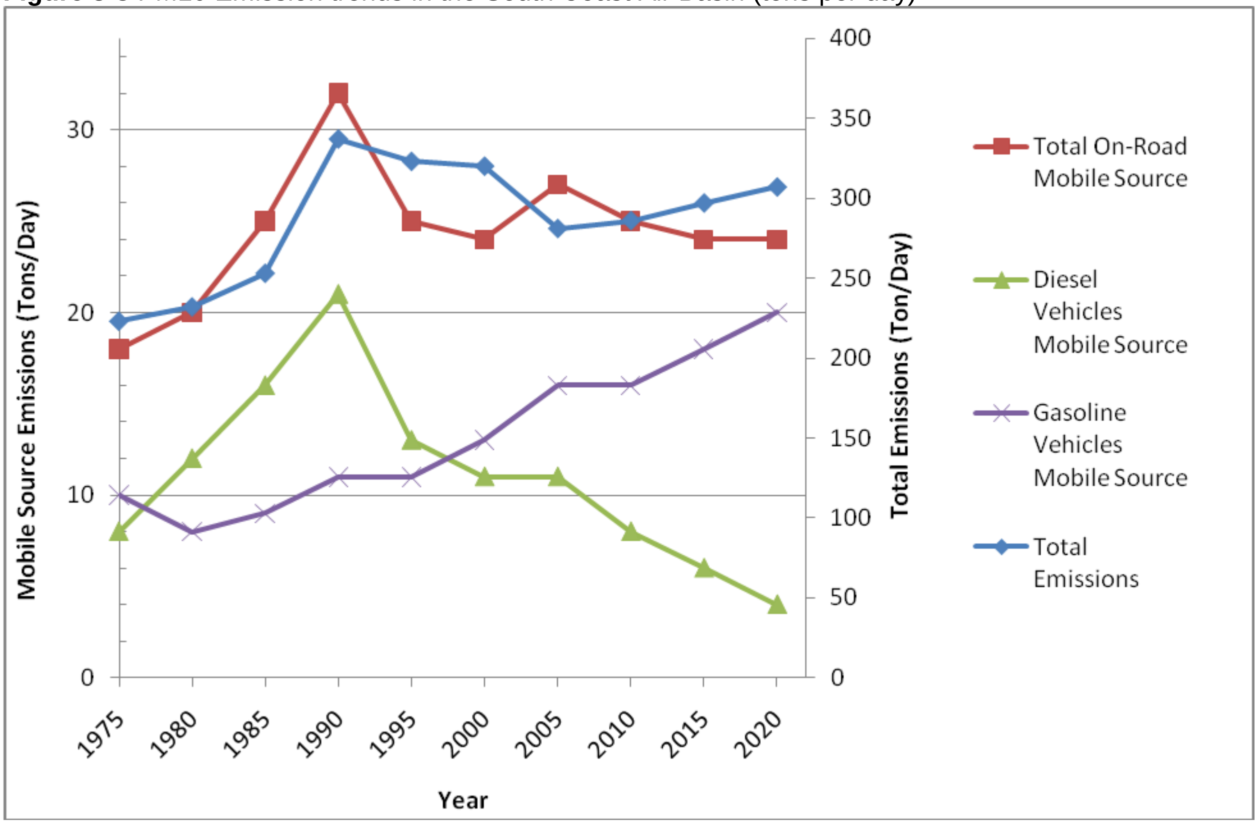


Source: California Air Resources Board 2009, compiled by ICF International February 2011.

Table 3-5. PM10 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	223	18	8	10
1980	232	20	12	8
1985	253	25	16	9
1990	337	32	21	11
1995	323	25	13	11
2000	320	24	11	13
2005	281	27	11	16
2010	286	25	8	16
2015	297	24	6	18
2020	307	24	4	20
Source: California Air Resources Board 2009				

Figure 3-8 PM10 Emission trends in the South Coast Air Basin (tons per day)



Source: California Air Resources Board 2009, compiled by ICF International February 2011

The emissions trends presented in Tables 3-4 and 3-5 and Figures 3-10 and 3-11 indicate that total on-road emissions are expected to maintain a decreasing trend through 2020, with increases in emissions from on-road gasoline vehicles offset by substantial decreases in emissions from on-road diesel vehicles. Emissions of directly emitted PM2.5 and PM10 from diesel motor vehicles have been decreasing since their peak levels in 1990 even though population and vehicles miles traveled (VMT) are increasing due to adoption of more stringent emission standards.

Tables 3-4 and 3-5 and Figures 3-7 and 3-8 indicate that total on-road PM2.5 and PM10 emissions increased between 1975 and 1990, the year in which emissions peaked (25 tons/day for PM2.5 and 32 tons/day for PM10). Total on-road emissions decreased between 1990 and 2000, increased in 2005, and are projected to show a decreasing trend through 2020.

3.2.3 Population and Traffic Growth

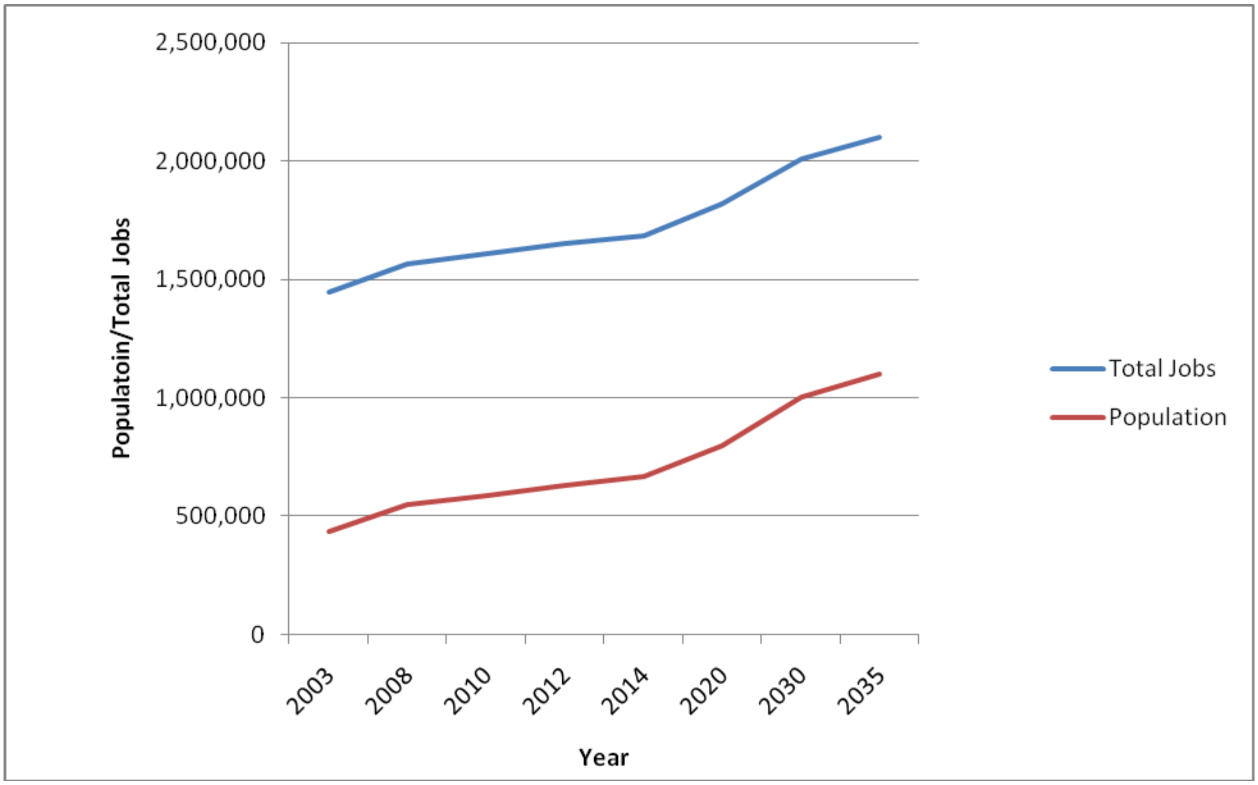
3.2.3.1 Regional Population Growth

As indicated in Tables 3-4 and 3-5 and Figures 3-7 and 3-8, total PM2.5 and PM10 emissions in the SCAB are projected to increase slightly through 2020, although total on-road emissions are expected to decrease through 2020. This trend is despite the fact that Riverside County population residing in the SCAB is anticipated to increase from 1,446,000 in 2003 to 1,818,000 in 2020 and jobs are anticipated to increase from 433,000 in 2003 to 797,000 in 2020, as indicated in Table 3-6 and Figure 3-9.

Table 3-6. SCAG Regional Population and Employment Projections for Riverside County

	2003	2008	2010	2012	2014	2020	2030	2035
Population	1,446,000	1,567,000	1,611,000	1,653,000	1,684,000	1,818,000	2,011,000	2,102,000
Total Jobs	433,000	547,000	588,000	629,000	670,000	797,000	1,005,000	1,098,000
Source: Southern California Association of Governments 2008								

Figure 3-9. SCAG Regional Population and Housing Projections



Source: Southern California Association of Governments 2008

3.2.3.2 Regional Traffic Growth

With population and employment growth expected to occur regionally (Table 3-6 and Figure 3-9), it is anticipated that this anticipated growth could result in increased traffic within the project area. Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineers, Iteris. (Greene pers. comm.). Iteris provided both peak and off-peak hour VMT data and VMT distribution by 5-mph speed bins[1] (5 mph to 75 mph). VMT data included vehicle activity for affected roadways in the immediate project area. The

[1] Traffic data are apportioned into separate 5 mph categories between the speeds of 5 to 75 mph. Each 5 mph category is known as a speed bin.

traffic data used for emissions modeling is summarized Appendix A. Data for the conditions have been evaluated for the following conditions:

1. project corridor;

2. the local project region (Western Riverside County); and

3. the larger project region (Western Riverside County to the Pacific Ocean)

Changes in total net emissions in PM are less pronounced in the local project region and larger project regionbut more substantial in the project corridor.. This is because the project corridor represents traffic traveling on the corridor only and does not analyze the effects of the project to other roadways. The local project region and larger project region analyze the effects of the project on a broader scope, showing congestion improvements which lead to smaller changes in net emissions over no build conditions. Tables A-1 through A-4 in Appendix A present project corridor VMT and VHT (Vehicle Hours Traveled) traffic data, with total traffic data presented in Tables A-1 and A-2 and truck data presented in Tables A-3 and A-4. Tables A-5 through A-8 in Appendix A present local project region VMT and VHT traffic data, with total traffic data presented in Tables A-5 and A-6 and truck data presented in Tables A-7 and A-8. Tables A-9 through A-12 in Appendix A present larger project region VMT and VHT traffic data, with total traffic data presented in Tables A-9 and A-10 and truck data presented in Tables A-11 and A-12.

Tables 3-7 through 3-9 present a summary comparison of VMT and average speed data associated with Alternatives 1 and 2 under both existing and future-year no-build conditions, with Table 3-7 presenting project corridor traffic data, Table 3-8 presenting local project region traffic data, and Table 3-9 presenting larger project region traffic data. The data from Tables 3-7 through 3-9 are summarized from the data found in Tables A-1 through A-12 in Appendix A and indicate that implementation of the build alternatives are expected to result in increases in VMT when compared to no build conditions. While the build conditions would increase VMT, average peak hour and nonpeak hour speeds are also increasing, which indicates that implementation of the project is causing improved traffic operations and overall system efficiency.

Tables 3-7 through 3-9 also indicate that VMT increases are highest under the project corridor condition (1,328,409 increase in VMT), followed by the local project region (738,294 increase in VMT), with the larger project region having the smallest increase in VMT (556,941 increase in VMT). The large VMT increases seen under the project corridor condition is because the project corridor condition only evaluates traffic directly on the expanded freeway and does not evaluate the increased network efficiency and congestion-relief effects of the project on other roadways in the area. The regional emissions analysis, which evaluates the effects of the project on roadways in the local project region, indicates that the project would result in increased network efficiency and reduced congestion on the immediate roadway network, with the most benefit seen under the largerproject region, which is likely the result of more roadways showing a benefit with increased network efficiency and congestion-relief resulting from the project, since it evaluates a larger area.

Table 3-7. Vehicle Miles Traveled and Average Speed Comparison by Alternative - Project Corridor

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	12,075,856	41.77	6,562,562	36.17	5,513,294	51.20	403,867	61.23	695,732	60.94
2020 No Build	15,431,038	39.01	8,329,783	33.07	7,101,255	49.43	563,673	60.85	963,602	60.41
2020 Alt 1	16,269,998	42.37	9,126,723	37.72	7,143,275	50.28	557,812	60.34	955,368	59.97
2020 Alt 2	16,328,299	42.42	9,114,797	37.67	7,213,502	50.44	562,756	60.88	961,982	60.41
2040 No Build	20,357,458	35.47	10,951,164	29.11	9,406,294	47.58	788,985	61.19	1,352,631	60.81
2040 Alt 1	21,685,867	38.70	12,049,965	33.10	9,635,902	49.09	773,733	60.53	1,327,389	60.13
2040 Alt 2	21,681,111	38.79	12,031,325	33.16	9,649,786	49.23	785,428	61.19	1,346,317	60.72
Comparison of VMT and Speed										
Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1 - Existing	4,194,142	0.60	2,564,161	1.55	1,629,981	-0.92	153,945	-0.89	259,636	-0.97
2020 Alt 2- Existing	-12,075,856	0.65	2,552,235	1.50	1,700,208	-0.76	158,889	0.00	266,250	-0.53
2040 Alt 1- Existing	9,610,011	-3.07	5,487,403	-3.07	4,122,608	-2.11	369,866	-0.70	631,657	-0.81
2040 Alt 2- Existing	9,605,255	-2.98	5,468,763	-3.01	4,136,492	-1.97	381,561	-0.04	650,585	-0.22
2020 Alt 1 - 2020 NB	-12,075,856	3.35	796,940	4.65	42,020	0.85	-5,861	-0.51	-8,234	-0.45
2020 Alt 2- 2020 NB	897,261	3.40	785,014	4.60	112,247	1.01	-917	0.03	-1,620	-0.01
2040 Alt 1- 2040 NB	1,328,409	3.23	1,098,801	3.99	229,608	1.51	-15,252	-0.66	-25,242	-0.68
2040 Alt 2 - 2040 NB	1,323,653	3.32	1,080,161	4.05	243,492	1.65	-3,557	0.00	-6,314	-0.09

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Table 3-8. Vehicle Miles Traveled and Average Speed Comparison by Alternative – Local Project Region (Western Riverside County)

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	44,260,055	36.07	24,479,239	30.76	19,780,816	45.88	1,457,252	59.87	2,518,308	59.27
2020 No Build	62,473,450	30.86	34,570,011	24.69	27,903,439	44.70	1,824,519	57.69	3,143,457	57.20
2020 Alt 1	62,780,699	31.97	34,869,362	25.98	27,911,337	44.93	1,823,845	57.52	3,142,498	57.06
2020 Alt 2	62,857,439	31.99	34,882,101	25.99	27,975,338	44.94	1,824,495	57.68	3,143,277	57.20
2040 No Build	86,062,844	24.40	47,473,731	18.09	38,589,113	42.74	2,442,964	57.84	4,212,207	57.62
2040 Alt 1	86,723,666	25.12	47,984,214	18.78	38,739,452	43.16	2,448,407	57.67	4,221,428	57.44
2040 Alt 2	86,801,138	25.21	48,063,114	18.88	38,738,024	43.20	2,450,856	57.92	4,225,329	57.64

Comparison of VMT and Speed

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1- Existing	18,520,644	-4.10	10,390,123	-4.78	8,130,521	-0.95	366,593	-2.35	624,190	-2.21
2020 Alt 2 - Existing	18,597,384	-4.08	10,402,862	-4.77	8,194,522	-0.94	367,243	-2.19	624,969	-2.07
2040 Alt 1 - Existing	42,463,611	-10.95	23,504,975	-11.98	18,958,636	-2.72	991,155	-2.20	1,703,120	-1.83
2040 Alt 2 - Existing	42,541,083	-10.86	23,583,875	-11.88	18,957,208	-2.68	993,604	-1.95	1,707,021	-1.63
2020 Alt 1- 2020 NB	307,249	1.11	299,351	1.28	7,898	0.23	-674	-0.17	-959	-0.14
2020 Alt 2 - 2020 NB	383,989	1.13	312,090	1.29	71,899	0.24	-24	0.00	-180	0.00
2040 Alt 1- 2040 NB	660,822	0.72	510,483	0.69	150,339	0.42	5,443	-0.17	9,221	-0.18
2040 Alt 2- 2040 NB	738,294	0.81	589,383	0.79	148,911	0.46	7,892	0.08	13,122	0.02

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Table 3-9. Vehicle Miles Traveled and Average Speed Comparison by Alternative – Larger Project Region (Western Riverside County to Pacific Ocean)

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	200,238,742	33.34	108,889,013	28.40	91,349,729	42.07	4,250,658	57.59	7,578,832	55.73
2020 No Build	239,539,853	31.39	129,403,605	25.99	110,136,248	41.53	4,773,952	56.75	8,507,535	55.09
2020 Alt 1	239,666,657	31.72	129,574,470	26.40	110,092,187	41.59	4,773,205	56.69	8,506,374	55.05
2020 Alt 2	239,753,660	31.70	129,561,694	26.38	110,191,966	41.55	4,773,990	56.75	8,507,474	55.09
2040 No Build	287,708,347	28.11	155,007,313	22.18	132,701,034	40.87	5,757,421	56.97	10,313,535	55.68
2040 Alt 1	288,186,312	28.44	155,401,667	22.54	132,784,645	41.00	5,761,115	56.90	10,319,551	55.61
2040 Alt 2	288,265,288	28.42	155,475,214	22.52	132,790,074	41.01	5,764,178	57.01	10,324,495	55.69

Comparison of VMT and Speed

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1- Existing	39,427,915	-1.62	20,685,457	-2.00	18,742,458	-0.48	522,547	-0.90	927,542	-0.68
2020 Alt 2 - Existing	39,514,918	-1.64	20,672,681	-2.01	18,842,237	-0.52	523,332	-0.84	928,642	-0.64
2040 Alt 1 - Existing	48,646,459	-4.90	46,512,654	-5.86	41,434,916	-1.08	1,510,457	-0.69	2,740,719	-0.11
2040 Alt 2 - Existing	48,598,631	-4.92	46,586,201	-5.88	41,440,345	-1.07	1,513,520	-0.58	2,745,663	-0.04
2020 Alt 1- 2020 NB	126,804	0.33	170,865	0.41	-44,061	0.06	-747	-0.07	-1,161	-0.05
2020 Alt 2 - 2020 NB	213,807	0.31	158,089	0.40	55,718	0.02	38	0.00	-61	0.00
2040 Alt 1- 2040 NB	477,965	0.33	394,354	0.36	83,611	0.13	3,694	-0.08	6,016	-0.07
2040 Alt 2- 2040 NB	556,941	0.32	467,901	0.34	89,040	0.14	6,757	0.04	10,960	0.01

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Mainline Average Daily Traffic and Truck Volumes

Table 3-1 presents total and truck ADT volumes for the I-15 corridor in Riverside County. The project traffic engineers, Iteris provided truck percentage data as a function of VMT, which is presented in Tables A-1 through A-12 in Appendix A (Iteris. Greene pers. comm., 2011). The truck percentages from the provided VMT data in Appendix A were applied to the ADT volumes provided by Iteris to calculate total truck ADT for mainline I-15 presented in Table 3-1. Table 3-1 indicates that, relative to the no-build alternatives, total ADT is expected to increase under the build alternatives , with Alternative 1 having higher traffic volumes than Alternative 2. In addition, Table 3-1 also indicates that truck ADTis expected to decrease under the build alternatives within the project corridor and the local project region, with respect to no build alternatives. Within the larger project region, truck ADT remains constant throughout no-build and build alternatives in 2020, and it decreases slightly under the build alternatives relative to the no-build alternatives in 2040.

Roadway and Intersection Level of Service

Appendix B presents the following data:

Existing, 2020 no build, and 2040 no build alternatives

- mainline,
- ramp,
- weaving, and
- intersection LOS

Build Alternatives 1 and 2

- mainline,
- ramp,
- weaving,
- HOV/tolled lane,
- and intersection LOS

The data presented in Appendix B indicates that implementation of the project would generally improve system-wide operations in the vicinity project area.

Table 3-10 presents a summary of intersection volume and LOS/delay data from Appendix B and evaluates the total number of intersections experiencing changes in intersection volumes and LOS/delay between the build and no-build alternatives. Similarly, Table 3-11 presents a summary of mainline freeway segment speed and density data from Appendix B and evaluates the number of mainline freeway segments experiencing changes in speed and density between the build and no build alternatives. It should be noted that Table 3-10 and Table 3-11 do not present the magnitude of the actual changes in volumes, LOS/delay, speed, and density. Instead, Tables 3-10 and 3-11 only summarize the total number of intersections and segments that would experience these changes. Table 3-10 indicates that, in 2020, more intersections would experience improvements (decreases) in volumes than would experience worsened (increases) volumes increase for both AM and PM peak hour conditions. Table 3-10 also indicates that more intersections would experience improvements (decreases) in LOS/delay under AM peak hour condition, while more intersections would experience more worsened (increases) LOS/delay under PM peak hour conditions in 2020. However, under full buildout conditions in 2040, more intersections would experience improvements (decreases) in volumes and LOS/delay than would experience worsened (increases) volumes and LOS/delay. This indicates that the project would result in increased network efficiency and congestion-relief, likely leading to decreases in pollutant emissions.

Table 3-10. Summary of Changes in Intersection LOS/Delay between Build and No-build Alternatives

Condition		2020				2040			
		Delay decreases/improves	**Delay increases/worsens**	**Volumes decreases/improves**	**Volumes increase/worsen**	**Delay decreases/improves**	**Delay increases/worsens**	**Volumes decrease/improve**	**Volumes increase/worsen**
AM	Alternative 1	56	49	60	53	71	38	75	38
	Alternative 2	55	49	81	32	76	33	70	43
PM	Alternative 1	44	61	60	53	62	44	75	38
	Alternative 2	43	62	81	32	98	8	70	43

(Iteris. Greene pers. comm., compiled by ICF, International March 2011.)

Table 3-11. Summary of Changes in Mainline Freeway Segment Speed and Density between Build and No-build Alternatives

2020									
Condition		Southbound				Northbound			
		Speed decreases/worsens	**Speed increases/improves**	**Density increases/worsens**	**Density decreases/improves**	**Speed decreases/worsens**	**Speed increases/improves**	**Density increases/worsens**	**Density decreases/improves**
AM	Alternative 1	14	17	13	20	11	21	3	30
	Alternative 2	2	30	0	34	11	22	3	31
PM	Alternative 1	15	17	13	19	9	26	6	29
	Alternative 2	6	24	11	30	14	24	11	27
2040									
AM	Alternative 1	2	26	2	27	3	24	4	24
	Alternative 2	1	32	0	34	8	21	6	23
PM	Alternative 1	13	12	11	14	12	16	12	16
	Alternative 2	14	18	14	18	13	17	12	18

(Iteris. Greene pers. comm., compiled by ICF, International March 2011.)

Congestion Relief and System-Wide Improvements

The project would provide congestion relief and improve system-wide operations by improving traffic flow. The project would increase overall speeds during both the opening and horizon years (see Tables 3-7 through Tables 3-9). In 2020, Table 3-7 indicates that speeds would increase by approximately 3.4 mph relative to the no build alternative, while speeds would increase between 3.23 and 3.32 mph in 2040, relative to the no build alternative. Table 3-8 indicates that speeds in the local project region in 2020 would increase approximately 1.1 mph relative to the no build alternative, while speeds would increase between 0.72 and 0.81 mph in 2040, relative to the no build alternative. As shown in Table 3-9, speeds in the larger project region in 2020 would increase by up to 0.33 mph relative to the no build alternative, while speeds in 2040 would increase by 0.33 mph as well, relative to the no build alternative.

PM emissions typically follow a U-shaped curve relative to speed, with highest emissions observed at the lowest and highest speeds. Typically, emissions are typically higher at the lowest speeds and tend to decrease as speeds increase to the most efficient/ lowest emission speed of around 45 mph. As speeds increase from 45 mph upward, emissions tend to increase as speeds increase. Thus, 45 mph, the speed at which emissions are at a minimum, is the approximate target speed for reducing PM emissions. Tables 3-7 through 3-9 show that speeds associated with total VMT are increasing towards the ideal emissions speed of 45 miles per hour under build conditions. Because speeds under opening (2020) and horizon-year (2040) no build conditions are well below 45 miles per hour (i.e, higher), the increases in speeds (Tables 3-7 through 3-9) due to the project results in an improvement in PM emissions. As shown in table 3-11, a majority of mainline freeway segments will experience improvements (increases) in roadway speeds and density/congestion (decreases) relative to the no build scenario, except for the situation of southbound segments for Alternative 1 in the PM peak hour. In this scenario, more segments will experience worsened (decreases) speeds than would show improvements (increases) in speeds. For all other scenarios, the number of segments experiencing improved conditions (increases in speeds and decreases in density/congestion) outnumber the number of segments experiencing worsened conditions.

3.2.4 Traffic Emissions Analysis

The project traffic engineers (Iteris) calculated daily VMT, VHT, and speed data (Table 3-7 through Table 3-9, and Appendix A), as well as vehicle LOS and delay for vehicle trips along the I-15 corridor, within the local project region (Western Riverside County), and larger project region (Western Riverside County to the Pacific Ocean) as shown in Appendix B. The Department's CT-EMFAC model[2] was used to calculate PM10 and PM2.5 exhaust, tire wear, and brake wear emissions for each of the project alternatives and analysis years. Emissions estimates are included below in Table 3-12 through Table 3-14. The CT-EMFAC program assumed a SCAB vehicle fleet mix, adjusted for project-specific truck fleet percentages (Table 3-

[2] CT-EMFAC is a California-specific project-level analysis tool for modeling criteria pollutant and carbon dioxide emissions from on-road mobile sources. The model uses the latest version of the California Mobile Source Emission Inventory and Emission Factors model, EMFAC2007. While regulations and emissions controls adopted after 2007 are not reflected in the model emission factors, CT-EMFAC is the latest on-road emissions modeling tool and is used as standard practice in air quality technical analyses.

1), operating under annual-average conditions. Vehicle fleet mixes were based on visual traffic counts by the traffic engineer (Iteris 2010), and MSAT speciation factors were based on ARB factors.

3.2.4.1 Re-entrained Road Dust Analysis

The CT-EMFAC model does not estimate re-entrained road dust emissions. Therefore, re-entrained road dust emissions were calculated using the empirical equation found in Section 13.2.1 of the EPA's *AP-42 Compilation of Air Pollutant Emission Factors*, which was updated in January 2011. Emissions were calculated using VMT traffic data supplied by the traffic engineers (Appendix A) and the emission factor as calculated using the empirical road dust equation. Variables to calculate road dust emissions were taken from traffic data (VMT and vehicle weight) and from nearby climate stations (precipitation). As previously indicated, PM10 re-entrained road dust emissions are considered based on the EPA's final transportation conformity rule, while PM2.5 re-entrained road dust emissions are evaluated because the ARB has determined that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the project area. The EPA published updated guidance in their AP-42 Compilation of Air Pollutant Emission Factors in January 2011 for evaluating re-entrained road dust for SIP development and conformity purposes. Therefore, the analysis of re-entrained road dust emissions uses emission factors from the January 2011 update to AP-42 Section 13.2.1. Calculated PM10 and PM2.5 re-entrained road dust emissions are presented in Tables 3-12 through 3-14.

Table 3-12 summarizes the modeled daily emissions resulting from exhaust, brake and tire wear, and re-entrained road dust for the project corridor, Table 3-13 presents emissions for the localproject region (Western Riverside County), and Table 3-14 presents emissions for the larger project region (Western Riverside County extending west to the Pacific Ocean). Emissions associated with implementation of the proposed project were obtained by comparing future Build Alternative emissions to future No Build emissions for both 2020 and 2040. The differences in emissions between build Alternative and no build alternativerepresent emissions generated directly as a result of implementation of the build alternatives.

As indicated in Table 3-12, total PM10 and PM2.5 emissions would increase slightly along the project corridor, with PM10 emissions increasing by up to 3.14% in 2020 and 2.94% in 2040, while PM2.5 emissions would increase by up to 3.50% in 2020 and 2.87% in 2040. The project corridor condition analyzed in Table 3-12 only evaluates traffic operating directly on the I-15 corridor and does not evaluate traffic on other roadways or the effects of the project on other local roadways in the vicinity of the project area (i.e., trip redistribution and congestion relief on other roadways).

While Table 3-12 indicates that emissions would increase slightly along the project corridor, Table 3-13, which evaluates project emissions in the local project region and takes into account the effects of the project corridor on other roadways in the local project region (i.e., the effects of the project on regional trip distribution and congestion on the roadway network in the region), indicates that total project-related PM10 emissions will have a negligible increase (less than

0.13% in 2020 and 0.36% in 2040), while PM2.5 emissions are expected to decrease by up to 0.32% in 2020 and 0.36% in 2040.

Table 3-12. I-15 Project-Related Particulate Emissions for the Project Corridor (pounds per day)

Scenario	PM10			PM2.5		
	Exhaust/ Brake/ Tire Wear	Road Dust	Total	Exhaust/ Brake/ Tire Wear	Road Dust	Total
Existing (2007)	655	2,121	2,776	598	521	1,119
2020 No build	670	2,819	3,488	620	692	1,312
2020 Alternative 1	688	2,886	3,574	638	708	1,347
2020 Alternative 2	696	2,902	3,598	646	712	1,358
2040 No build	855	3,831	4,686	803	940	1,743
2040 Alternative 1	868	3,921	4,789	818	962	1,780
2040 Alternative 2	876	3,948	4,824	824	969	1,793
Comparison of Emissions between Build Alternatives and Existing Conditions, Project Corridor						
2020 Alternative 1 - Existing	33	765	798	40	187	228
2020 Alternative 2 - Existing	41	781	822	48	191	239
2040 Alternative 1 - Existing	213	1,800	2,013	220	441	661
2040 Alternative 2 - Existing	221	1,827	2,048	226	448	674
Comparison of Emissions (Percent Change)between Build Alternatives and Existing Conditions, Project Corridor						
2020 Alternative 1 - Existing	5.10%	36.06%	28.75%	6.73%	35.96%	20.34%
2020 Alternative 2 - Existing	6.29%	36.80%	29.60%	8.03%	36.70%	21.38%
2040 Alternative 1 - Existing	32.52%	84.87%	72.51%	36.79%	84.64%	59.07%
2040 Alternative 2 - Existing	33.74%	86.14%	73.78%	37.79%	85.99%	60.23%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Project Corridor						
2020 Alt 1 – 2020 No Build	19	67	86	18	16	34
2020 Alt 2 -– 2020 No Build	27	83	110	26	20	46
2040 Alt 1 – 2040 No Build	13	90	103	15	22	37
2040 Alt 2 – 2040 No Build	21	117	138	21	29	50
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Project Corridor						
2020 Alt 1 – 2020 No Build	2.81%	2.38%	2.46%	2.86%	2.38%	2.61%
2020 Alt 2 -– 2020 No Build	3.98%	2.94%	3.14%	4.11%	2.94%	3.50%
2040 Alt 1 – 2040 No Build	1.52%	2.35%	2.20%	1.87%	2.34%	2.12%
2040 Alt 2 – 2040 No Build	2.46%	3.05%	2.94%	2.62%	3.09%	2.87%

Table 3-13. I-15 Project-Related Particulate Emissions for the Local Project Region (Western Riverside County) (pounds per day)

Scenario	PM10			PM2.5		
	Exhaust/ Brake/ Tire Wear	**Road Dust**	**Total**	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**
Existing (2007)	2,378	7,726	10,104	2,167	1,896	4,063
2020 No build	2,819	10,335	13,154	2,604	2,537	5,141
2020 Alternative 1	2,793	10,363	13,155	2,581	2,544	5,124
2020 Alternative 2	2,800	10,371	13,171	2,588	2,546	5,134
2040 No build	4,018	14,070	18,088	3,776	3,454	7,230
2040 Alternative 1	3,967	14,146	18,113	3,732	3,472	7,204
2040 Alternative 2	3,994	14,159	18,153	3,755	3,475	7,230
Comparison of Emissions between Build Alternatives and Existing Conditions, Region, Local Project Region						
2020 Alternative 1 - Existing	415	2,637	3,051	414	648	1,061
2020 Alternative 2 - Existing	422	2,645	3,067	421	650	1,071
2040 Alternative 1 - Existing	1,589	6,420	8,009	1,565	1,576	3,141
2040 Alternative 2 - Existing	1,616	6,433	8,049	1,588	1,579	3,167
Comparison of Emissions (Percent Change) between Build Alternatives and Existing Conditions, Local Project Region						
2020 Alternative 1 - Existing	17.44%	34.13%	30.20%	19.10%	34.15%	26.13%
2020 Alternative 2 - Existing	17.75%	34.24%	30.36%	19.44%	34.27%	26.36%
2040 Alternative 1 - Existing	66.82%	83.10%	79.27%	72.22%	83.12%	77.31%
2040 Alternative 2 - Existing	67.96%	83.26%	79.66%	73.28%	83.28%	77.95%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Local Project Region						
2020 Alt 1 – 2020 No Build	-26	28	2	-23	7	-16
2020 Alt 2 -– 2020 No Build	-19	36	18	-16	9	-7
2040 Alt 1 – 2040 No Build	-51	76	25	-44	18	-26
2040 Alt 2 – 2040 No Build	-24	89	65	-21	21	0
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Local Project Region						
2020 Alt 1 – 2020 No Build	-0.92%	0.27%	0.01%	-0.89%	0.27%	-0.32%
2020 Alt 2 -– 2020 No Build	-0.66%	0.35%	0.13%	-0.60%	0.35%	-0.13%
2040 Alt 1 – 2040 No Build	-1.27%	0.54%	0.14%	-1.17%	0.52%	-0.36%
2040 Alt 2 – 2040 No Build	-0.60%	0.63%	0.36%	-0.56%	0.61%	0.00%

Table 3-14. I-15 Project-Related Particulate Emissions for the Larger Project Region (Western Riverside County to Pacific Ocean) (pounds per day)

	PM10			PM2.5		
Scenario	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**
Existing (2007)	9,459	29,506	38,965	8,624	7,242	15,867
2020 No build	10,151	34,529	44,680	9,391	8,475	17,866
2020 Alternative 1	10,113	34,539	44,653	9,357	8,478	17,835
2020 Alternative 2	10,118	34,549	44,667	9,361	8,480	17,842
2040 No build	12,385	41,577	53,962	11,666	10,205	21,872
2040 Alternative 1	12,319	41,631	53,950	11,607	10,219	21,825
2040 Alternative 2	12,345	41,646	53,991	11,629	10,222	21,852
Comparison of Emissions between Build Alternatives and Existing Conditions, Region, Larger Project Region						
2020 Alternative 1 - Existing	655	5034	5688	733	1236	1968
2020 Alternative 2 - Existing	659	5,043	5,703	737	1,238	1,975
2040 Alternative 1 - Existing	2,860	12,125	14,985	2,982	2,976	5,958
2040 Alternative 2 - Existing	2,886	12,140	15,026	3,005	2,980	5,985
Comparison of Emissions (Percent Change) between Build Alternatives and Existing Conditions, Larger Project Region						
2020 Alternative 1 - Existing	6.92%	17.06%	14.60%	8.50%	17.06%	12.40%
2020 Alternative 2 - Existing	6.97%	17.09%	14.64%	8.54%	17.09%	12.45%
2040 Alternative 1 - Existing	30.23%	41.09%	38.46%	34.58%	41.09%	37.55%
2040 Alternative 2 - Existing	30.51%	41.14%	38.56%	34.84%	41.14%	37.72%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Larger Project Region						
2020 Alt 1 – 2020 No Build	-38	10	-27	-34	3	-32
2020 Alt 2 -– 2020 No Build	-33	20	-13	-30	5	-25
2040 Alt 1 – 2040 No Build	-66	54	-12	-60	13	-47
2040 Alt 2 – 2040 No Build	-40	69	29	-37	17	-20
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Larger Project Region						
2020 Alt 1 – 2020 No Build	-0.37%	0.03%	-0.06%	-0.36%	0.03%	-0.18%
2020 Alt 2 -– 2020 No Build	-0.33%	0.06%	-0.03%	-0.32%	0.06%	-0.14%
2040 Alt 1 – 2040 No Build	-0.54%	0.13%	-0.02%	-0.51%	0.13%	-0.21%
2040 Alt 2 – 2040 No Build	-0.32%	0.17%	0.05%	-0.32%	0.17%	-0.09%

While Table 3-13 evaluates emission in the local project region (Western Riverside County), Table 3-14 evaluates emissions within the larger project region (Western Riverside County to the Pacific Ocean) to evaluate the effects of the project corridor on other roadways in the larger project region. In 2020, the larger project region is projected to see decreases in PM10 emissions by up to .06%, while emissions could decrease by 0.02% for Alternative 1 and increase slightly by up to 0.05% for Alternative 2 in 2040. For PM2.5, emissions are anticipated to decrease by up to 0.18% in 2020 and up to 0.21% in 2040.

It should be noted that Tables 3-13 and 3-14 both show overall decreases in exhaust-related emissions and increases in re-entrained road dust emissions. So, while VMT is increasing, exhaust emissions are decreasing due to improvements in roadway congestion, travel speeds, and network efficiency. The observed increase in re-entrained road dust emissions is attributed to the overall increase in VMT, as emissions of re-entrained road dust is a function of VMT. Because VMT is expected to increase in the regional analyses, re-entrained road dust emissions increases exceed the decreases in exhaust, break, and tire wear emissions, resulting in a net increase in emissions over no build conditions.

3.3 Conclusion

Within the project corridor, emissions of PM2.5 and PM10 are expected to increase for both alternatives in the range of 2-3.5% from no build conditions. Because the project corridor condition only evaluates traffic directly on the expanded freeway and does not evaluate the increased network efficiency and congestion-relief effects of the project on other roadways in the area, emission increases seen under the project corridor condition are due primarily to the increased VMT traveling directly on the expanded freeway (the project corridor condition would result in a VMT increase of up to 1,328,409 VMT when compared to the no build condition), leading to increased exhaust and re-entrained road dust emissions (Table 3-12). However, the local regional emissions analysis, which evaluates the effects of the project on roadways in the local project region, indicates that the project would result in increased network efficiency and reduced congestion on the immediate roadway network. The local regional condition would result in a VMT increase of up to 738,294 VMT when compared to the no build condition. The emissions analysis indicates that emissions of PM2.5 and PM10 would either increase negligibly (PM10) or decrease (PM2.5) relative to no build conditions (Table 3-13). The emissions modeling further indicates that exhaust emissions would decrease under all conditions and alternatives, and that the negligible PM10 increase is directly attributable to re-entrained road dust from the increase in VMT slightly offsetting exhaust emission reductions. The larger project regional emissions analysis (Table 3-14) indicates that decreases in PM10 and PM2.5 emissions are expected in 2020. In 2040, PM10 emissions would increase slightly under Alternative 2, as a result of re-entrained dust from increased VMT, while PM10 emissions under Alternative 1 would show a net decrease. For PM2.5, Table 3-14 indicates that total emissions would decrease under both Alternatives. This is likely the result of more roadways showing a benefit with increased network efficiency and congestion-relief resulting from the project (the larger regional condition would result in a VMT increase of up to 556,941 VMT when compared to the no build condition).

Transportation conformity is required under CAA section 176(c) (42 U.S.C. 7506(c)) and requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS. As required by Final EPA rule published on March 10, 2006, this qualitative assessment demonstrates that the I-15 Corridor Improvement Project meets the CAA conformity requirements and will not conflict with state and local measures to improve regional air quality.

Implementation of the proposed project will not result in new violations of the federal PM2.5 or PM10 air quality standards for the following reasons:

- Based on representative monitoring data, ambient PM2.5 are on a decreasing trend (see Figures 3-4 and 3-5). Ambient PM10 concentrations are following a decreasing trend as well. (see Figure 3-6)
- Based on representative monitoring data, PM10 24-hour concentrations have not exceeded the national standard, 150 $\mu g/m^3$, in the past two years. It should be noted that the exceedence of national standards in 2007 was due to wildfires and strong winds in the region; thus, the national 24 hour maximum value for Norco in 2007 is not a characteristic measurement (California Air Resources Board n.d.), and the decreasing trend at the station in 2008 through 2009 should be seen as characteristic.
- While the Mira Loma Van Buren and Lake Elsinore monitoring stations have experienced exceedences of the federal PM2.5 NAAQS, representative monitoring data indicates that PM2.5 concentration have decreased over the past three years, is nearing the national standards, and concentrations should be below the annual average PM2.5 standard if the trend continues.
- In general, construction of the build alternative would result in improved level of service in the local project region as a whole, as the project increases efficiency of the roadway, resulting in improvements in regional emissions.
- Construction of the build alternative would result in improvement to overall speeds in the project corridor, local project region and larger project during both the opening and horizon years, resulting in improvements in regional emissions.
- Total project-related emissions within the larger project region (Western Riverside County to Pacific Ocean) would show a net decrease, relative to no build alternatives under future build alternatives (2020 and 2040), except under Alternative 2 in 2040, which would see a minor 0.05% increase in PM10 emissions, indicating that any increases in PM emissions due to the project, if any, will be minimal. (Table 3-14). This, taken in conjunction with the decreasing emissions trends in on-road PM emissions indicates that the project would not increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS.
- Implementation of the proposed project would decrease diesel truck percentages under build alternatives relative to no-build alternatives within the project corridor and the local project

region. Within the larger project region, diesel truck percentages remain constant in 2020 and decrease in 2040, over no build alternatives. (Table 3-1).

For these reasons, future or worsened PM2.5 or PM10 violations of any standards are not anticipated. Therefore, the proposed I-15 Corridor Improvement Project meets the conformity hot spot requirements in 40 CFR 93.116 and 93.126 for PM10 and PM2.5.

Chapter 4 References Cited

4.1 Printed References

California Air Resources Board 2009. The California Almanac of Emissions and Air Quality - 2009 Edition, Chapter 4 Air Basin Trends and Forecasts- Criteria Pollutants. Pgs.4-10 and 4-11. Last Revised March 27,2009. Available at <http://www.arb.ca.gov/aqd/almanac/almanac09/pdf/chap409.pdf>. Accessed February 17, 2011.

California Air Resources Board 2011. Top 4 Measurements and Days Above the Standard. Available at: <http:// http://www.arb.ca.gov/adam/welcome.html>. Accessed: January 24, 2011.

California Air Resources Board. nd . PM2.5 and PM10 Natural Event Document: Southern California High Winds and Wildfires October/November 2007. Last Revised: n.d. Available at <http://www.arb.ca.gov/desig/excevents/2007ned_draft.pdf>. Accessed March 7, 2011.

South Coast Air Quality Management District 2003. Final 2003 Air Quality Management Plan. August 2003. Diamond Bar, CA.

South Coast Air Quality Management District 2007. Final 2007 Air Quality Management Plan. June 2007. Diamond Bar, CA.

South Coast Air Quality Management District 2009a. Table 1: File Names and Corresponding City Names. Last Revised: May 21, 2009. Available at <http://www.aqmd.gov/smog/metdata/ISCST3_Table1.html>. Accessed February 16, 2011.

South Coast Air Quality Management District 2009b. Table 1 Meteorological Sites. Last Revised: May 27, 2009. Available at <http://www.aqmd.gov/smog/metdata/AERMOD_Table1.html>. Accessed February 16, 2011

Southern California Association of Governments 2008. 2008 Regional Transportation Plan: Making the Connections, Transportation Conformity Report. Pgs. 13 and 14. Last Revised: May 8, 2008. Available at <http://www.scag.ca.gov/rtp2008/pdfs/finalrtp/reports/fConformity.pdf>. Accessed February 17, 2011.

4.2 Personal Communications

Greene, Steven. Associate Vice President. Iteris, Inc. Los Angeles, CA. December 16, 2010—email.

Chapter 1 Introduction

The Riverside County Transportation Commission (RCTC), in cooperation with the California Department of Transportation (Department) District 8, proposes to improve Interstate (I-) 15 from just north of the I-15/I-215 junction in the City of Murrieta (in Riverside County), northward to the San Bernardino County line. The purpose of the proposed project is intended to improve both existing and future mobility, reduce congestion, and improve mainline merge and diverge movements along I-15 within Riverside County. The total length of the project is approximately 43.5 miles and traverses the cities of Murrieta, Wildomar, Lake Elsinore, Corona, and Norco and portions of unincorporated Riverside County.

The proposed project is included in the Southern California Association of Governments' (SCAG's) 2011 Federal Transportation Improvement Plan (FTIP) under project number RIV071267, which was found to be conforming by FHWA on December 14, 2010[1]. As such, the proposed project's operational-period emissions (which include the ozone [O_3] precursors reactive organic gases [ROG] and oxides of nitrogen [NO_X]) meet the regional transportation conformity requirements imposed by the U.S. Environmental Protection Agency (EPA) and the South Coast Air Quality Management District (SCAQMD). Therefore, the proposed project must undergo a project-level air quality analysis, but not a regional conformity-level air quality analysis.

This project-level particulate matter impact hot spot analysis for the I-15 Corridor Improvement Project responds to the EPA's requirement for a hot spot analysis for particulate matter of diameter less than or equal to 2.5 microns (PM2.5), as required in the EPA's March 10, 2006 Final Transportation Conformity Rule (71 FR 12468). The effects of localized PM2.5 hot spots were evaluated using the EPA and FHWA's guidance manual, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration, and U.S. Environmental Protection Agency 2006).[2] This qualitative PM hotspot analysis demonstrates how the proposed project meets project-level PM conformity requirements for PM_{10} and $PM_{2.5}$.

[1] Project described in Final 2011 FTIP as "I-15 – SBD CO Line to Jct 1-15/I-215: Construct 4 HOT Lns (2 HOT lns in ea dir) from SBD Co line to Hidden Valley Pkwy and from Cajalco Rd to SR-74; cons 2 mf lns (1 ln ea dir from SBD co line to SR-74); cons 2 HOT lns (1 hot ln ea dir) from Hidden Valley Pkwy to Cajalco Rd; cons 2 HOV lns (1 ln ea dir) from SR74 to JCT I-15/I-205 (PA&ED only)."

[2] The availability of new EPA guidance documents was announced in the Federal Register on December 20, 2010, (75 FR 79370) for completing quantitative particulate matter ($PM_{2.5}$ and PM_{10}) hot-spot analyses. The announcement also provided for a 2-year grace period before use of the new quantitative PM hot-spot guidance is required for project-level PM conformity determinations. Until December 20, 2012, project-level conformity determinations made using the 2006 qualitative guidance remain appropriate.

Chapter 2 Project Location and Description

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purposes, while avoiding or minimizing environmental impacts. The alternatives include two Build Alternatives and the No-Build Alternative.

RCTC, in cooperation with the Department District 8, proposes to improve I-15 from just north of the I-15/I-215 junction in the City of Murrieta (in Riverside County), northward to the San Bernardino County line. The total length of the project is approximately 43.5 miles and traverses the cities of Murrieta, Wildomar, Lake Elsinore, Corona, and Norco and portions of unincorporated Riverside County. A project vicinity map is provided as Figure 2-1, and a Project Location Map is provided as Figure 2-2.

2.1 Build Alternatives

The I-15 Corridor Improvement Project is evaluating two build alternatives in addition to the No-Build Alternative. The build alternatives are as follows:

Build Alternative 1 would:

- Add (in each direction) between I-215 and SR-74 one high-occupancy-vehicle (HOV) lane;
- Add (in each direction) between SR-74 and SR-60:
  - One mixed-flow (MF) lane and
  - One HOV lane;
- Add auxiliary lanes at needed locations; and

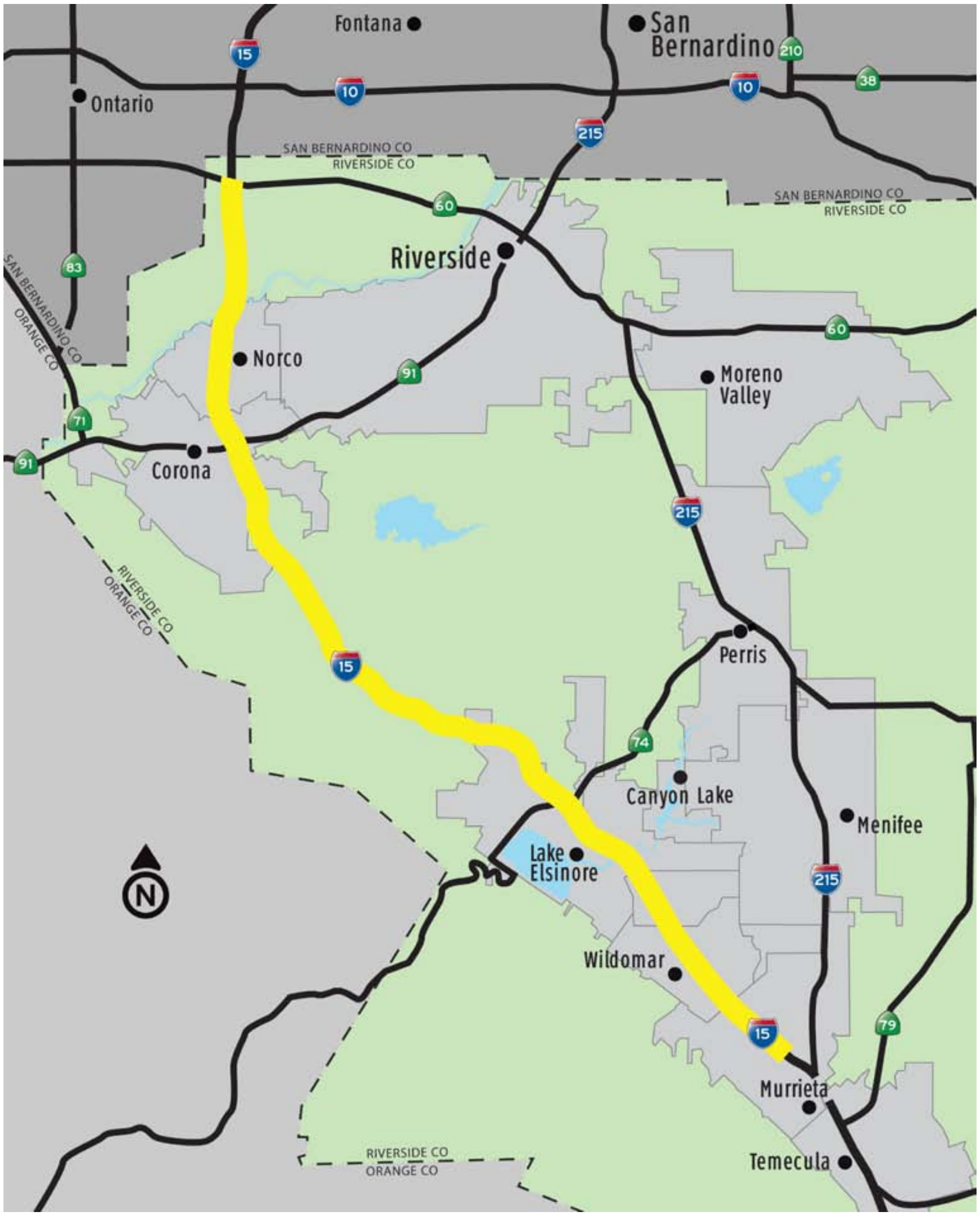
No new connections or ramps would be added as part of this alternative.

Build Alternative 2 would:

- Add (in each direction) between I-215 and SR-74 one HOV lane;
- Add (in each direction) between SR-74 and SR-60:
  - One mixed-flow lane and
  - Two tolled express (HOT) lanes;
- Add auxiliary lanes at needed locations

No new connections or ramps would be added as part of this alternative.

Figure 2-1 Project Vicinity



HDR 2010

Figure 2-2 Project Location

HDR 2010

Additionally, each build alternative would include additional project components such as retaining walls, sound walls, storm water runoff treatment devices, and bridge widenings, replacements, and reconstructions to accommodate the new auxiliary lanes and HOV or tolled express lanes. Permanent right-of-way acquisitions would be needed to accommodate the improvements, and temporary construction easements would be required to stage construction equipment, build components of the facility, and/or access some areas. The layouts and typical cross sections of the proposed freeway under Build Alternative 1 and Build Alternative 2 are illustrated in Figures 2-3a and 2-3b and Figure 2-4, respectively.

Due to 43.5-mile project limits, figure sizes are extremely large (i.e., ninety-three (93) 11 by 17 pages each for Figure 2-3a and Figure 2-3b, and nine (9) pages for Figure 2-4). As such, these figures are not included as part of this document. If interested in reviewing figures, please contact ICF International to arrange for FTP access or CD delivery.

- *Primary contact: Keith Cooper (KCooper@icfi.com), 213-627-5376*
- *Alternate Contact: Mari Piantka (MPiantka@icfi.com), 949-333-6615*

2.2 No Build Alternative

The No-Build Alternative would maintain the existing lanes on the I-15as they exist today. This alternative does not preclude the construction of future improvements or general maintenance to improve the operation of the facility or incorporate safety enhancements. The projected growth and development forecasts indicate that traffic volumes will increase along the corridor. Without the additional proposed capacity and operational improvements, the increased traffic demand would increase traffic congestion, leading to a degraded level of service (LOS) and an increase in delays and would have substantial adverse impacts on the environment and the community. As a result, the No-Build Alternative is not consistent with the project need and purpose and the I-15 Route Concept Report (RCR). The No-Build Alternative provides a baseline for comparing the impacts with the other build alternatives. It is used to compare the relative impacts and benefits of the proposed project improvements, but would not meet the identified purpose and need.

Chapter 3 PM10 and PM2.5 Hot Spot Analysis

The following is the I-15 Corridor Improvement Project hot spot conformity analysis for particulate matter less than or equal to 10 microns in diameter (PM10) and particulate matter less than or equal to 2.5 microns in diameter (PM2.5). In accordance with the final Transportation Conformity Rule, 40 CFR 93.116 and 93.123 (b)(1), this project is defined as a Project of Local Air Quality Concern (PLAQC) and requires a qualitative PM2.5 and PM10 hot spot analysis..

3.1 Regulatory Background

Under 1990 Clean Air Act Amendments, the U.S. Department of Transportation (DOT) cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide ($NO_{2)}$, ozone ($O_{3)}$, and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTPs) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments (SCAG) for Riverside County and the appropriate federal agencies, such as the Federal Highway Administration (FHWA), make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

The concept of transportation conformity was introduced in the CAA 1977 amendments. Transportation conformity requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to new air quality violations of the NAAQS. Conformity requirements were made substantially more rigorous in the 1990 CAAA, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993.

DOT and the EPA developed guidance for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (*40 Code of Federal Regulations* [*CFR*] *51* and *40 CFR 93*). The demonstration of conformity to the SIP is the responsibility of the local Metropolitan Planning Organization (MPO), which is also responsible for preparing RTPs and associated demonstration of SIP conformity. Section 93.114 of the Transportation Conformity Rule, states that "there must be a currently conforming regional transportation plan and transportation improvement plan at the time of project approval."

The SCAG is the designated federal MPO and state regional transportation planning agency for Riverside County. As such, SCAG coordinates the region's major transportation projects and programs, and promotes regionalism in transportation investment decisions.

3.1.1 Statutory Requirements for PM Hotspot Analyses

On March 10, 2006, the EPA issued a final transportation conformity rule (40 CFR 51.390 and Part 93) that addresses local air quality impacts in PM10 and PM2.5 nonattainment and maintenance areas. The final rule requires a hot spot analysis to be performed for a PLAQC or any other project identified by the PM2.5 and PM10 SIP as a localized air quality concern. Transportation conformity, under CAA section 176(c) (42 U.S.C. 7506(c)), requires that federally supported highway and transportation project activities conform to the State Implementation Plan (SIP). The rule provides criteria and procedures to ensure that these activities will not cause or contribute to new violations, increase the frequency or severity of any existing violations, or delay timely attainment of the relevant NAAQS as described in 40 CFR 93.101.

EPA's final rule, 40 CFR 93.123(b)(1) defines a PLAQC as:

> (i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
>
> (ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
>
> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM2.5 or PM10 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

In March 2006, the FHWA and EPA issued a guidance document entitled *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to cause or contribute to new air quality violations, increase the frequency or severity of existing violations, or delay timely attainment of NAAQS for PM2.5 or PM10. The PM2.5 and PM10 hot spot analyses are required for project-level conformity because the area is in non-attainment for both PM 2.5 and PM10 standards.

For the assessment of PM2.5 and PM10 hotspots, the final rule is that a hotspot analysis is to be performed only for PLAQCs. PLAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a localized air quality concern. The following list provides examples of PLAQCs.

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8% or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operated at LOS D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

The list below provides examples of projects that are not of local air quality concern.

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E, or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen PM2.5 or PM10 violations.
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed

to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on PM2.5 or PM10 emissions.

For projects identified as not being a PLAQC, qualitative PM2.5 and PM10 (for regions without an approved conformity SIP) hotspot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that CAA and *40 CFR 93.116* requirements were met without a hotspot analysis, since such projects have been found to not be of local air quality concern under *40 CFR 93.123(b)(1).* Because this analysis assumes the area is classified as a nonattainment area for the federal PM2.5 and PM 10 standard, a determination must be made as to whether it would result in a PM2.5 or PM10 hotspot.

Of these five PLAQC types identified above, the project most likely falls into the first category of a "new or expanded highway projects that have a significant number of or significant increase in diesel vehicles." As indicated in Table 3-1, traffic volumes along I-15 are anticipated to exceed the EPA and FHWA's PLAQC guidelines of 125,000, and truck percentages for multiple scenarios are expected to exceed the PLAQC guidelines of 8% (i.e., 10,000 truck ADT). Consequently, the project is considered to be a PLAQC and qualitative project-level PM2.5 and PM10 hot spot analyses, consistent with FHWA and EPA's 2006 qualitative hot spot analysis guidance, were conducted to assess whether the project would cause or contribute to any new localized PM2.5 or PM10 violations; or increase the frequency or severity of any existing violations; or delay timely attainment of the PM10 or PM2.5 national ambient air quality standards (NAAQS).

Table 3-1. I-15 Mainline ADT Volume Calculation Assumptions

	Existing (2007)[1]		2020						2040					
			No Build[2]		Alternative 1[3]		Alternative 2[4]		No Build[5]		Alternative 1[6]		Alternative 2[7]	
Interstate 15	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
Between Murrieta Hot Springs Rd & I-215	109,000	9,925	104,449	10,338	112,965	10,506	110,817	10,348	160,363	16,870	170,834	16,552	170,705	16,784
At Murrieta Hot Springs Rd	100,113	9,116	100,189	9,916	108,904	10,129	107,132	10,004	152,149	16,006	167,695	16,248	163,129	16,039
Between Kalmia St/California Oaks Rd & Murrieta Hot Springs Rd	127,000	11,564	119,552	11,833	129,637	12,057	126,849	11,845	176,467	18,564	193,947	18,791	189,541	18,636
At Kalmia St/California Oaks Rd	106,000	9,652	103,479	10,242	113,471	10,553	111,019	10,367	154,366	16,239	171,409	16,608	166,201	16,341
Between Clinton Keith Rd & Kalmia St/California Oaks Rd	124,000	11,291	111,957	11,081	122,787	11,420	119,868	11,193	164,056	17,259	183,361	17,766	177,013	17,404
At Clinton Keith Rd	105,000	9,561	99,063	9,805	109,719	10,204	106,897	9,982	143,485	15,095	161,846	15,681	156,119	15,350
Between Baxter Rd & Clinton Keith Rd	123,000	11,200	115,376	11,419	127,591	11,867	124,208	11,599	166,056	17,469	187,140	18,132	180,788	17,776
At Baxter Rd	114,749	10,449	106,499	10,541	118,696	11,039	114,963	10,735	154,664	16,271	173,056	16,767	171,828	16,895
Between Bundy Canyon Rd & Baxter Rd	118,000	10,745	110,220	10,909	124,286	11,559	119,133	11,125	158,425	16,666	177,394	17,188	175,418	17,248
At Bundy Canyon Rd	103,375	9,413	101,117	10,008	114,671	10,665	109,214	10,198	139,655	14,692	160,488	15,550	154,891	15,229
Between Olive St & Bundy Canyon Rd	113,000	10,290	109,819	10,869	124,119	11,544	117,635	10,985	148,157	15,586	171,079	16,576	166,163	16,338
At Olive St	113,000	10,290	99,562	9,854	117,253	10,905	111,479	10,410	139,532	14,679	167,030	16,183	161,949	15,923
Between Railroad Canyon Rd & Olive St	113,000	10,290	109,648	10,852	126,981	11,810	119,897	11,196	148,959	15,670	181,158	17,552	174,998	17,206
At Railroad Canyon Rd	95,700	8,714	104,988	10,391	118,993	11,067	113,520	10,601	144,323	15,183	172,955	16,757	166,361	16,357
Between Franklin St & Railroad Canyon Rd	122,000	11,109	115,102	11,392	130,260	12,115	127,504	11,906	154,566	16,260	186,081	18,029	177,116	17,415
At Franklin St	122,000	11,109	112,230	11,108	127,364	11,845	124,602	11,635	150,602	15,843	179,630	17,404	171,437	16,856
Between Main St & Franklin St	122,000	11,109	118,040	11,683	135,630	12,614	131,899	12,317	165,449	17,405	188,162	18,231	179,848	17,683
At Main St	113,700	10,353	111,995	11,085	129,509	12,045	125,961	11,762	156,701	16,485	178,384	17,283	170,947	16,808
Central Ave (SR-74) On Ramp to Main St Off Ramp	119,000	10,836	124,360	12,308	137,732	12,810	134,226	12,534	169,181	17,798	189,957	18,405	186,050	18,293
At Central Ave (SR-74)	94,441	8,600	107,951	10,684	121,491	11,299	119,336	11,144	148,350	15,606	168,367	16,313	166,802	16,400
Between Nichols Rd & Central Ave (SR-74)	107,000	9,743	121,529	12,028	139,706	12,993	135,780	12,679	158,148	16,637	182,374	17,670	181,577	17,853
At Nichols Rd	101,856	9,275	113,079	11,192	135,179	12,572	131,913	12,318	152,213	16,013	176,027	17,055	177,695	17,471
Between Lake St & Nichols Rd	109,000	9,925	118,361	11,715	142,423	13,246	138,408	12,925	155,802	16,390	182,077	17,641	183,864	18,078
At Lake St	102,200	9,306	115,401	11,422	135,027	12,558	131,797	12,307	149,812	15,760	175,782	17,031	176,035	17,308
Between Horsethief Canyon Rd & Lake St	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	166,600	17,526	193,531	18,751	194,602	19,134
At Horsethief Canyon Rd	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	159,139	16,741	189,954	18,404	189,441	18,626

Interstate 15	Existing (2007)[1]		2020						2040					
			No Build[2]		Alternative 1[3]		Alternative 2[4]		No Build[5]		Alternative 1[6]		Alternative 2[7]	
	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
Indian Truck Trail Rd On Ramp to Horsethief Canyon Rd	115,000	10,472	134,733	13,335	155,626	14,474	151,681	14,164	173,276	18,229	204,261	19,791	202,353	19,896
At Indian Truck Trail Rd	111,400	10,144	130,181	12,885	151,297	14,071	146,339	13,665	169,044	17,783	201,409	19,514	198,901	19,556
Between Temescal Canyon Rd & Indian Truck Trail Rd	121,000	11,018	141,523	14,007	162,467	15,110	155,139	14,487	180,841	19,024	212,646	20,603	210,010	20,649
At Temescal Canyon Rd	114,400	10,417	132,373	13,102	157,206	14,621	148,748	13,890	166,619	17,528	203,796	19,746	199,925	19,657
Between Weirick Rd & Temescal Canyon Rd	131,000	11,929	138,891	13,747	160,921	14,966	156,151	14,581	181,571	19,101	215,474	20,877	211,849	20,830
At Weirick Rd	128,127	11,667	131,862	13,051	157,824	14,678	153,165	14,303	174,473	18,355	211,064	20,450	209,869	20,635
Between Cajalco Rd & Weirick Rd	146,000	13,294	137,800	13,639	164,860	15,333	161,823	15,111	180,363	18,974	213,855	20,720	211,279	20,774
At Cajalco Rd	136,300	12,411	135,088	13,370	162,205	15,086	159,042	14,851	173,526	18,255	207,393	20,094	205,543	20,210
Between El Cerrito Rd & Cajalco Rd	155,000	14,114	156,817	15,521	185,073	17,213	184,335	17,213	260,739	27,430	302,986	29,356	296,907	29,193
At El Cerrito Rd	149,260	13,591	150,986	14,944	176,957	16,458	176,055	16,440	260,739	27,430	302,986	29,356	296,907	29,193
Between Ontario Ave & El Cerrito Rd	160,000	14,569	174,470	17,268	191,683	17,827	195,452	18,251	285,812	30,067	330,228	31,995	325,094	31,964
At Ontario Ave	139,726	12,723	168,386	16,666	193,764	18,021	186,658	17,430	269,907	28,394	310,461	30,080	303,457	29,837
Between Magnolia Ave & Ontario Ave	160,000	14,569	180,766	17,891	208,247	19,368	203,043	18,960	265,826	27,965	304,790	29,531	298,599	29,359
At Magnolia Ave	139,037	12,660	168,832	16,710	193,888	18,032	189,042	17,653	247,605	26,048	286,039	27,714	278,650	27,398
Between SR-91 & Magnolia Ave	174,000	15,844	201,851	19,978	218,707	20,341	223,140	20,837	282,758	29,746	303,673	29,423	315,455	31,016
At SR-91	71,957	6,552	90,349	8,942	112,281	10,443	110,681	10,335	139,870	14,714	179,214	17,364	173,158	17,025
Between Hidden Valley Pkwy & SR-91	157,000	14,296	167,692	16,597	205,090	19,074	202,716	18,930	234,928	24,714	297,925	28,866	284,174	27,941
At Hidden Valley Pkwy	134,385	12,237	144,403	14,292	181,014	16,835	184,850	17,261	201,555	21,204	268,295	25,995	254,653	25,038
Second St & Hidden Valley Pkwy	156,000	14,205	169,777	16,804	208,551	19,396	207,118	19,341	230,011	24,197	295,080	28,590	287,791	28,296
At Second St	141,881	12,919	149,013	14,748	188,434	17,525	187,367	17,496	204,502	21,514	269,373	26,099	266,150	26,169
Between Sixth St & Second St	150,000	13,659	166,231	16,453	208,297	19,373	204,033	19,053	219,833	23,126	289,372	28,037	284,789	28,001
At Sixth St	132,200	12,038	157,158	15,555	196,794	18,303	194,851	18,195	204,324	21,495	273,192	26,469	266,941	26,246
Between Schleisman Rd & Sixth St	150,000	13,659	177,306	17,549	218,233	20,297	212,817	19,873	225,272	23,699	297,607	28,835	290,395	28,552
At Schleisman Rd	150,000	13,659	163,451	16,177	205,287	19,093	199,438	18,624	205,581	21,627	275,082	26,652	268,235	26,374
Between Limonite Ave & Schleisman Rd	150,000	13,659	171,337	16,958	212,393	19,753	209,834	19,594	221,522	23,304	297,537	28,828	287,373	28,255
At Limonite Ave	126,988	11,563	149,243	14,771	192,455	17,899	192,404	17,967	193,047	20,309	264,965	25,672	257,641	25,332
Between Cantu-Galleano Ranch Rd & Limonite Ave Off Ramp	150,000	13,659	171,161	16,941	216,303	20,117	215,907	20,161	229,140	24,106	302,850	29,343	294,647	28,970

Interstate 15	Existing (2007)[1]		2020						2040					
			No Build[2]		Alternative 1[3]		Alternative 2[4]		No Build[5]		Alternative 1[6]		Alternative 2[7]	
	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT	Total ADT	Truck ADT
At Cantu- Galleano Ranch Rd	138,819	12,641	162,896	16,123	204,465	19,016	207,165	19,345	220,692	23,217	283,977	27,514	281,080	27,637
Between SR-60 & Cantu-Galleano Ranch Rd	145,000	13,203	177,634	17,581	219,549	20,419	217,552	20,315	242,175	25,477	306,795	29,725	295,799	29,084
At SR-60	103,415	9,417	132,821	13,146	163,136	15,172	157,943	14,749	187,819	19,759	236,088	22,874	223,648	21,990
Between Jurupa St & SR60	14,000	1,275	229,050	22,670	255,364	23,750	247,246	23,088	312,113	32,834	356,015	34,494	340,160	33,445

1 Truck percentage under existing conditions is 9.11%, based on data provided by the project engineers (Iteris. Greene pers. comm., 2011 compiled by ICF International February 2011).

2 Truck percentage under the 2020 No Build Alternative is 9.90%, based on data provided by the project engineers (Iteris. Greene pers. comm., 2011 compiled by ICF International February 2011).

3 Truck percentage under 2020 Alternative 1 is 9.30%, based on data provided by the project engineers.

4 9.34% Truck percentage under 2020 Alternative 2 is based on data provided by the project engineers.

5 10.52%, Truck percentage under the 2040 No Build Alternative is 10.52%, based on data provided by the project engineers.

6 Truck percentage under 2040 Alternative 1 is 9.69%, based on data provided by the project engineers.

7 Truck percentage under 2040 Alternative 2 is 9.83%, based on data provided by the project engineers.

3.1.2 National Ambient Air Quality Standards

PM2.5 NAAQS:

- **24-hour Standard:** The old 1997 standard of 65 μg/m^3 was revised in 2006 to 35 μg/m^3
- **Annual Standard:** 15 μg/m^3

PM10 NAAQS:

- **24-hour Standard:** 150 μg/m^3

The (SCAB), the basin in which Riverside County resides, was designated as a serious nonattainment area from its previous designation of moderate nonattainment area for the federal PM10 standard on February 8, 1993. The SCAB was classified as a nonattainment area on April 5, 2005 for the federal PM2.5 standard. (South Coast Air Quality Management District 2003 & South Coast Air Quality Management District 2007.)

The 24-hour PM10 standard is based on the number of days in the calendar year with 24-hour recorded concentrations greater than 150μg/m^3; the number of days must be equal to or less than one. The annual PM10 standard is no longer used for determining federal attainment status. The 24-hour PM2.5 standard is based on 3-year average of the 98th percentile of 24-hour recorded concentrations; the annual standard is based on 3-year average of the annual arithmetic mean PM2.5 recorded concentrations. A PM2.5 hot-spot analysis must consider both standards, unless it is determined for a given area that meeting the controlling standard would ensure that CAA requirements are met for both standards. The interagency consultation process should be used to discuss how the qualitative PM2.5 hot-spot analysis meets statutory and regulatory requirements for both standards, depending on the factors that are evaluated for a given project.

3.2 Hot Spot Analysis

The final Transportation Conformity Rule requires a hot spot analysis to be performed for PLAQC, while projects identified as not being a PLAQC are not required to undergo a hot spot analysis. As indicated above, data from Table 3-1 indicates that the project is a PLAQC based on roadway traffic and truck ADT, and a qualitative PM2.5 and PM10 hot spot analysis consistent with FHWA and EPA's 2006 qualitative hot spot analysis guidance is required.

A hot-spot analysis is defined in Section 93.101 of 40 CFR as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot-spot analysis assesses the air quality impacts on a project-level – a scale smaller than an entire nonattainment or maintenance area, such as for congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets the federal CAA conformity requirements to support state and local air quality goals with respect to achieving the attainment status in a timely manner. When a hot-spot analysis is required, it is included within the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

3.2.1 Analysis Methodology and Types of Emissions Considered

The EPA and FHWA established in the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006) the following two methods for completing a PM2.5 and PM10 hot-spot analysis:

1. Comparison to another location with similar characteristics – (pollutant trend within the air basin)
2. Air quality studies for the proposed project location – (ambient PM trend analysis in the project area)

This analysis uses a combined approach to demonstrate that the proposed project would not result in a new or worsened PM2.5 or PM10 violation. Method 1 was used to establish that the proposed project area will meet the NAAQS. Method 2 was used to demonstrate that implementation of the proposed project would not delay attainment of the NAAQS.

The analysis was based on directly emitted PM2.5 and PM10 emissions, including tailpipe, brake wear, and tire wear. Re-entrained road dust is also included in the qualitative analysis, as PM10 re-entrained dust must be considered per conformity requirements and PM2.5 re-entrained road dust must be considered because the California Air Resources Board (ARB) has determined that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the region (South Coast Air Quality Management District 2007).

Secondary particles formed through PM2.5 and PM10 precursor emissions from a transportation project take several hours to form in the atmosphere, giving emissions time to disperse beyond the immediate project area of concern for localized analyses; therefore, they were not considered in this hot-spot analysis. Secondary emissions of PM2.5 and PM10 are considered as part of the regional emission analysis prepared for the conforming RTP and Federal Transportation Improvement Program (FTIP).

No phase of construction is anticipated to last more than 5 years at any one location. In addition, the project must comply with South Coast Air Quality Management District (SCAQMD) construction-related fugitive dust control measures (Rule 403), which will ensure that fugitive dust from construction activities are minimized. Consequently, construction-related PM2.5 and PM10 emissions were not included in the hot spot analysis per 40 CFR 93123(c)(5).

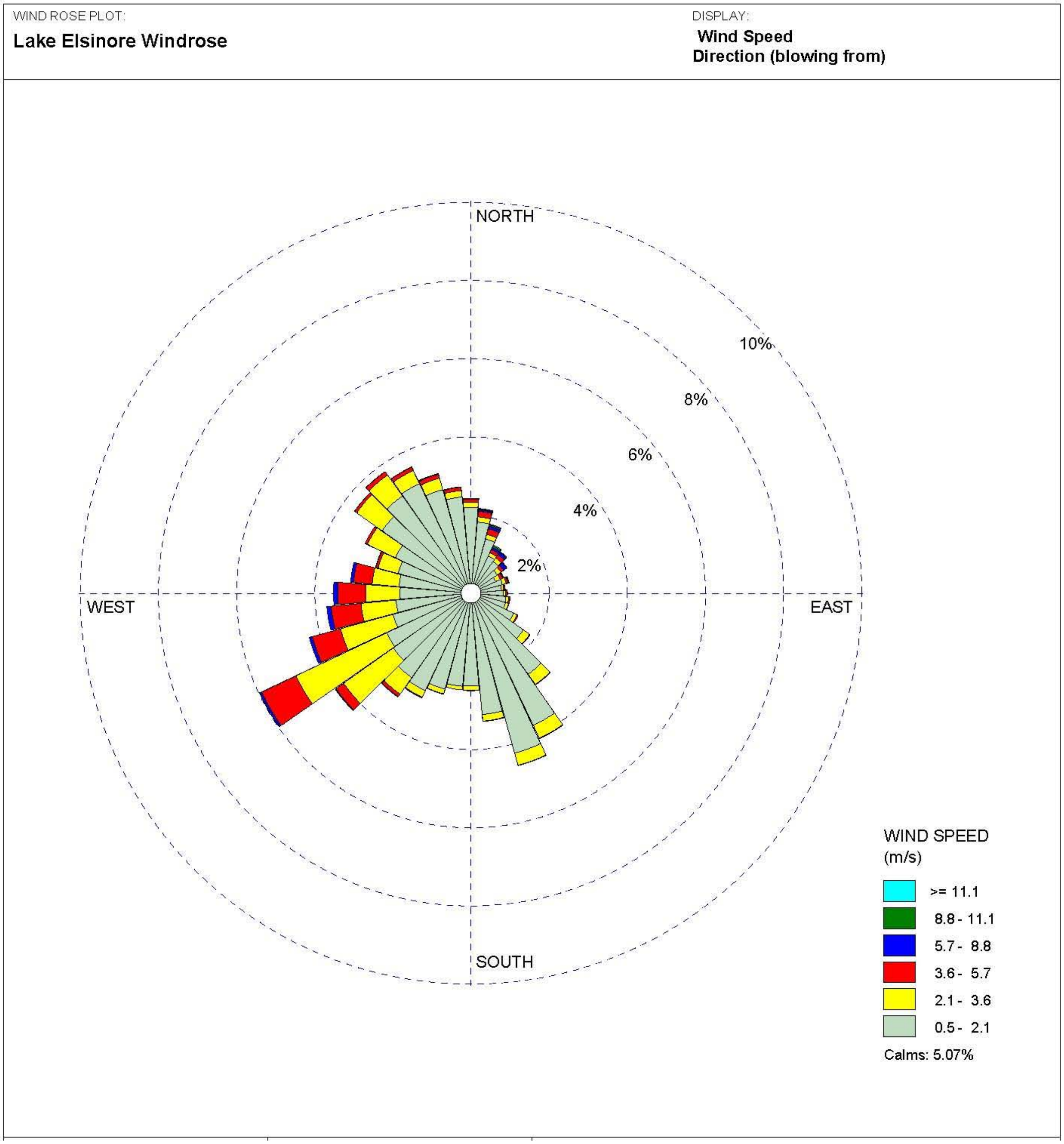
3.2.2 Air Quality Trend Analysis

Local air quality data was obtained from 4 monitoring stations: Mira Loma-Van Buren, Lake Elsinore, Norco, and Riverside. Air quality monitoring data is measured at Mira Loma-Van Buren, Lake Elsinore and Norco, while meteorological data is measured at Lake Elsinore, Norco and Riverside. The Mira Loma-Van Buren station is located at the Northeastern end of the project corridor, the Lake Elsinore station is located at the Southern end of the corridor, and the Riverside station is located at the Northeastern end of the corridor. The Norco station is located at the Northern end of the project corridor and is the nearest wind monitoring station. Data from the Lake Elsinore, Norco and Riverside monitoring stations have been included to characterize wind patterns in the project area. In addition to monitoring data, this analysis presents project-level PM2.5 and PM10 emissions in the future (2020 and 2040) years to help characterize the project's impact on total PM emissions generated in the project area and the impacts of the project and the likelihood of these impacts interacting with the ambient PM levels to cause PM hot spots.

3.2.2.1 Climate and Topography

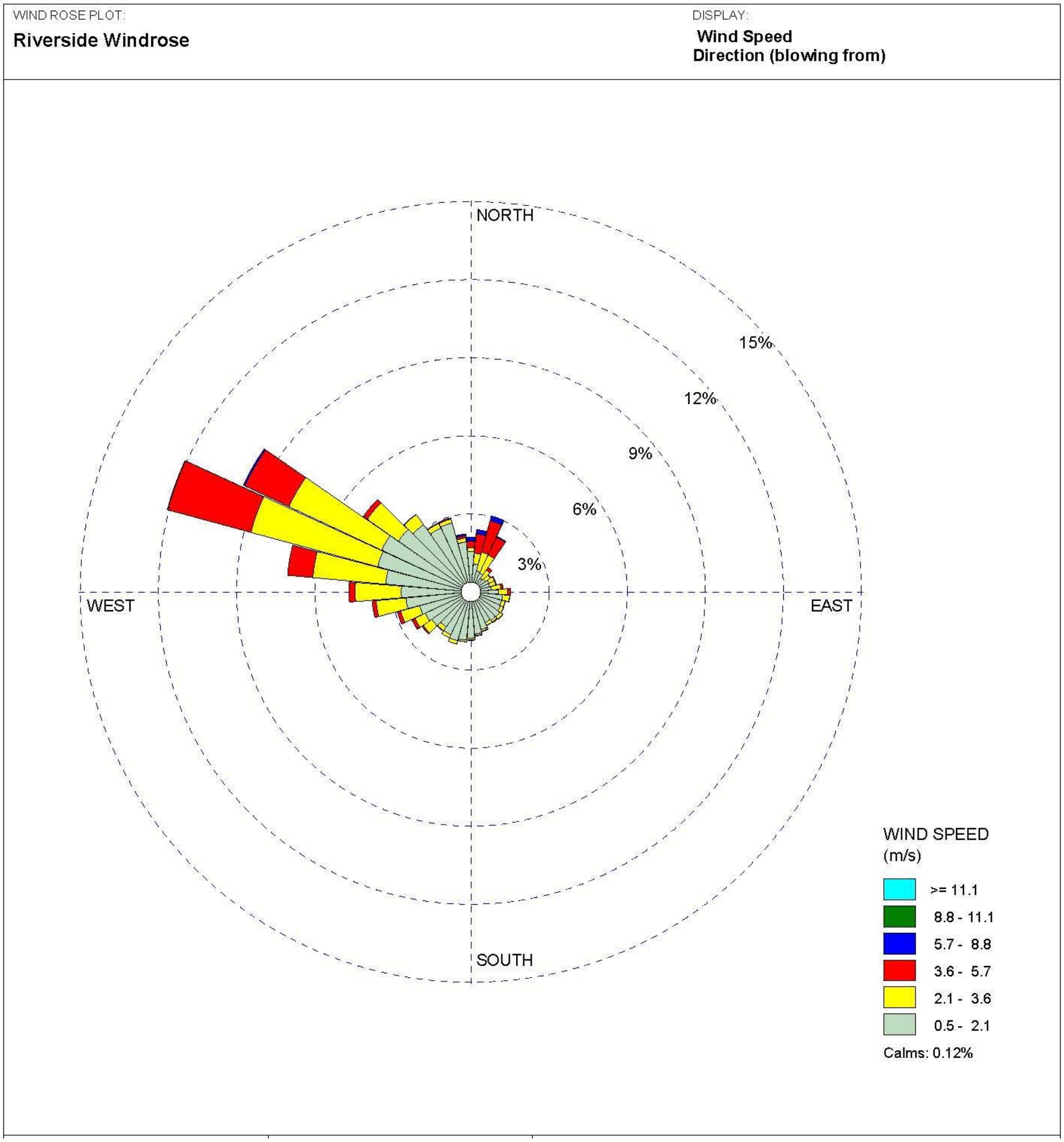
The proposed project lies within the 6,745 square mile SCAB. The SCAB is bounded by the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east and the Pacific Ocean to the West. The light winds and shallow vertical atmospheric mixing characteristic to the SCAB are present due to the region's terrain and geographical features. These characteristics contribute to the severity of air pollution issues in the SCAB. Figures 3-1 through 3-3 indicate the predominant wind direction in the regionbased on meteorological data from the Lake Elsinore, Norco and Riverside monitoring stations discussed above. (South Coast Air Quality Management District 2009a and b).

Figure 3-1. Predominant Wind Direction at Lake Elsinore Station



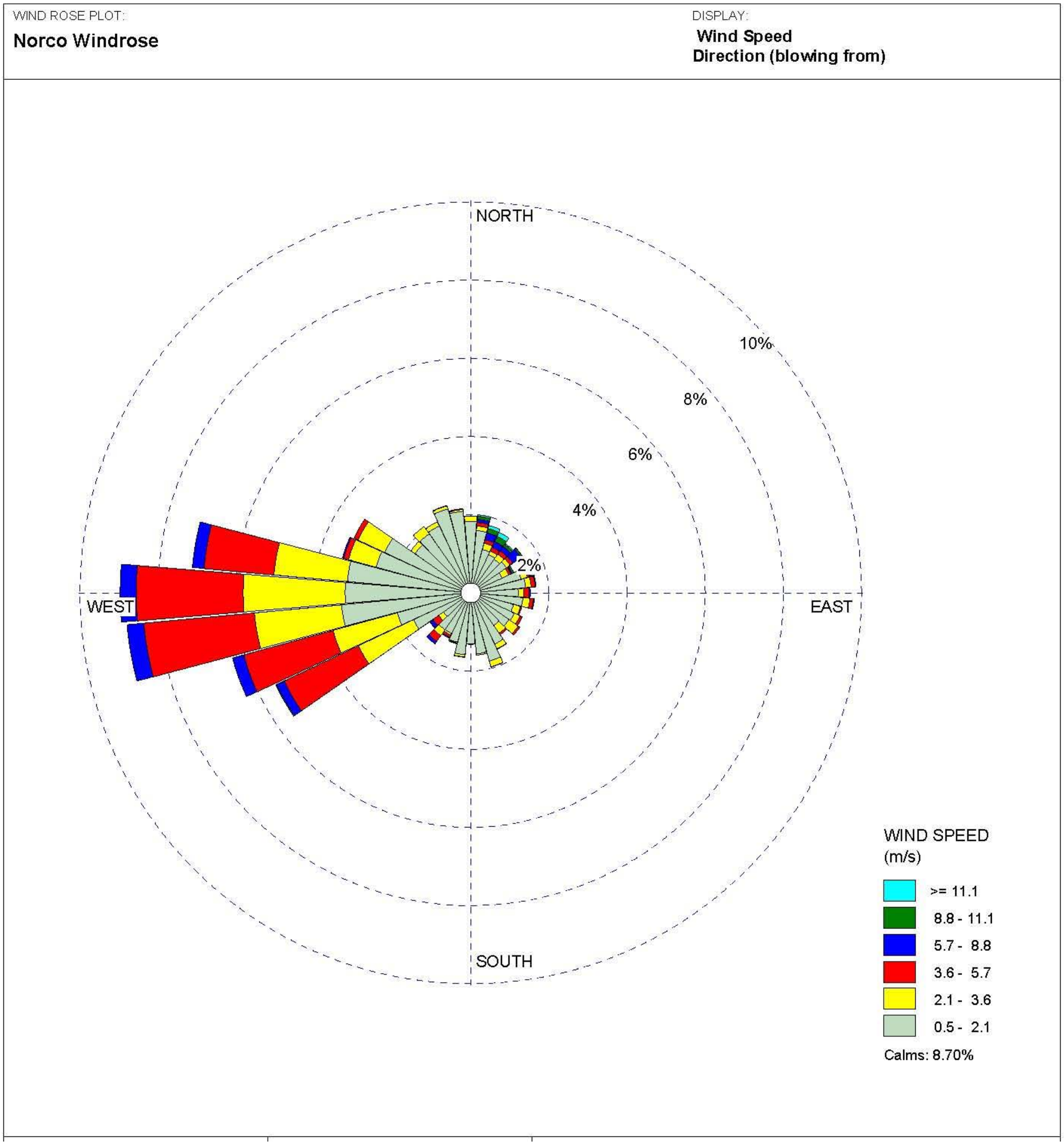
Source: South Coast Air Quality Management District 2009b

Figure 3-2. Predominant Wind Direction at Riverside Station



Source: South Coast Air Quality Management District 2009a

Figure 3-3. Predominant Wind Direction at Norco Station



Source: South Coast Air Quality Management District 2009b

3.2.2.2 Trends in Monitored Particulate Matter Concentrations

As required by the applicable transportation conformity regulations for PM, a trend analysis has been conducted and compared to the NAAQS.

PM2.5

Monitored PM2.5 concentrations for the Lake Elsinore and Mira Loma Van Buren monitoring stations are presented in Table 3-2. Monitored PM2.5 data is not collected at the Norco monitoring station. Monitored data presented in Table 3-2 is for the three-year period from 2007 to 2009, the last year which complete data is available.

Table 3-2 Ambient PM2.5 Monitoring Data (μg/m^3) at the Lake Elsinore and Mira Loma Van Buren Monitoring Stations (2007-2009)

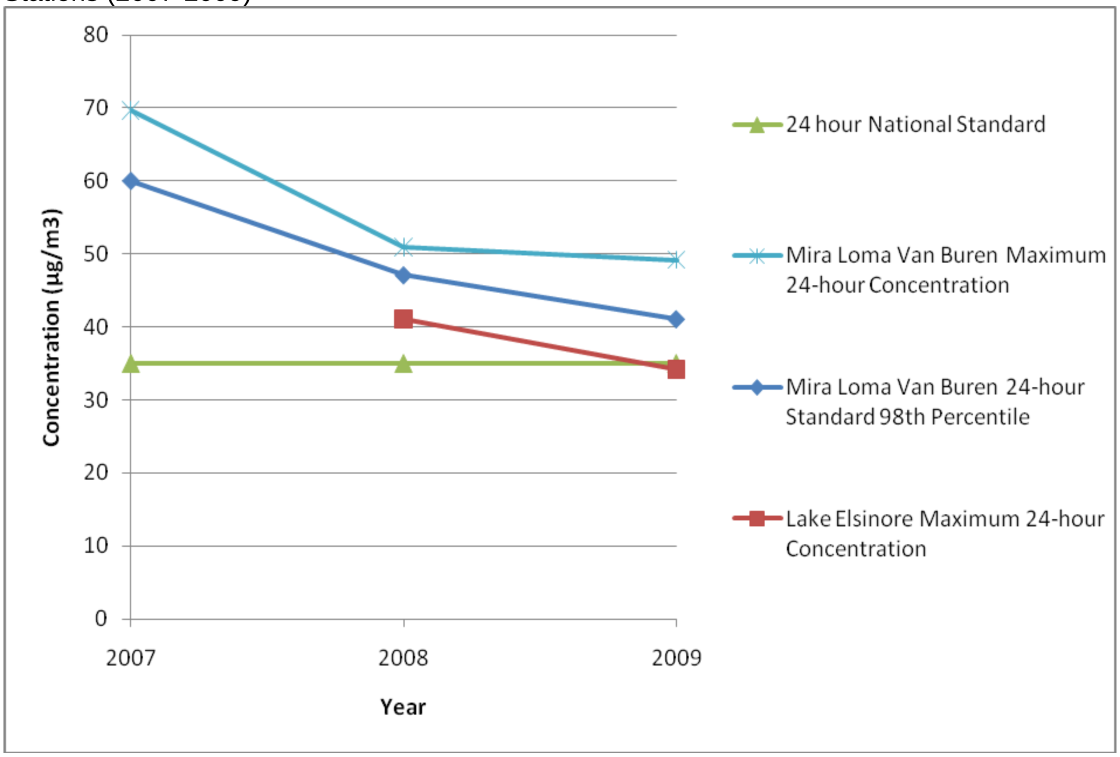
Metric	**2007**	**2008**	**2009**
Lake Elsinore			
Maximum 24-Hour Concentration	NA	41.1	34.2
Exceeds the federal 24-hour standard (35 μg/m^3)?	NA	Yes	No
National annual average	NA	NA	NA
Exceeds the federal annual average standard (15 μg/m^3)?	NA	NA	NA
Mira Loma Van Buren			
Maximum 24-Hour Concentration	69.7	50.9	49.2
24-Hour Standard 98^{th} Percentile	60	47.1	41.1
Exceeds the federal 24-hour standard (35 μg/m^3)?	Yes	Yes	Yes
National annual average	20.9	18.2	16.7
Exceeds the federal annual average standard (15 μg/m^3)?	Yes	Yes	Yes

Source: California Air Resources Board 2011, compiled by ICF International February 2011.

As indicated in Table 3-2 and Figure 3-6, maximum 24-hour PM2.5 concentrations at the Lake Elsinore monitoring station decreased from 41.1 μg/m^3 in 2008 to 34.2 μg/m^3 in 2009, the latter being under the national standard of 35 μg/m^3. Table 3-2 and Figure 3-6 also indicate that 24-hour concentrations at the Mira Loma Van Buren monitoring station decreased decrease between 2007 (69.7 μg/m^3) and 2009 (49.2 μg/$m^{3).}$ These values have remained above the current national standard of 35 μg/m^3, are below the old 24hour PM2.5 standard of 65 μg/m^3. While the national 24-hour PM2.5 standard has been exceeded at both stations in past years, Table 3-2 and Figure 3-

4 indicates there is a clear downward trend in emissions. The Lake Elsinore station has experienced decreasing emissions and measured concentrations below the PM2.5 standard in 2009, while concentrations at the Mira Loma Van Buren station have decreased significantly over the three year period. It is anticipated that concentrations should be below the 24-hour PM2.5 standard if the decreasing trend continues.

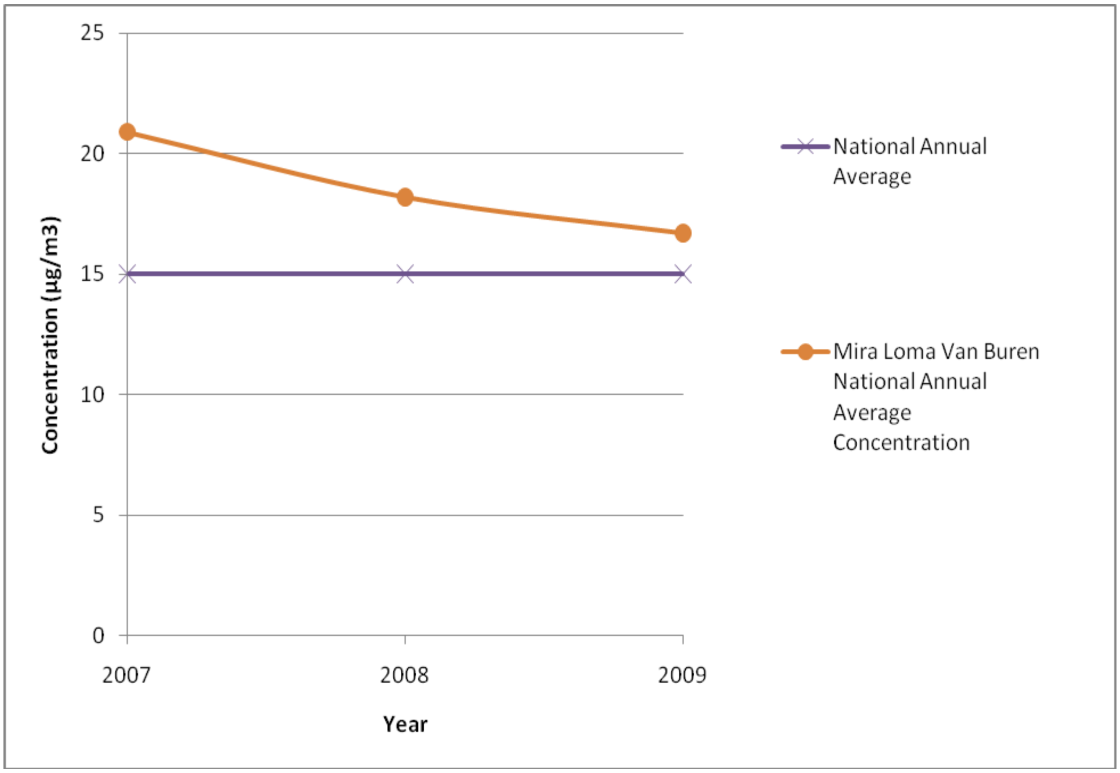
Figure 3-4. PM2.5 24-hour Concentrations (μg/m³) at the Mira Loma Van Buren and Lake Elsinore Stations (2007-2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

Table 3-2 also presents national annual average PM2.5 data from the Mira Loma Van Buren station. As seen in Table 3-2 and Figure 3-5, monitored annual average PM2.5 values have decreased over the three year period from 20.9 μg/m^3 in 2007 to 16.7 μg/m^3 in 2009, nearing the 15 μg/m^3 national standard. While monitored values were above the 15 μg/m^3 standard in 2009, concentrations should be below the annual average PM2.5 standard if the trend continues.

Figure 3-5. PM2.5 Annual Average Concentration (μg/m^3) at the Mira Loma Van Buren Station. (2007 through 2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

PM10

Monitored PM10 concentrations for the Lake Elsinore, Mira Loma Van Buren, and Norco monitoring stations are presented in Table 3-3. Monitored data presented in Table 3-3 is for the three-year period from 2007 to 2009, the last year which complete data is available.

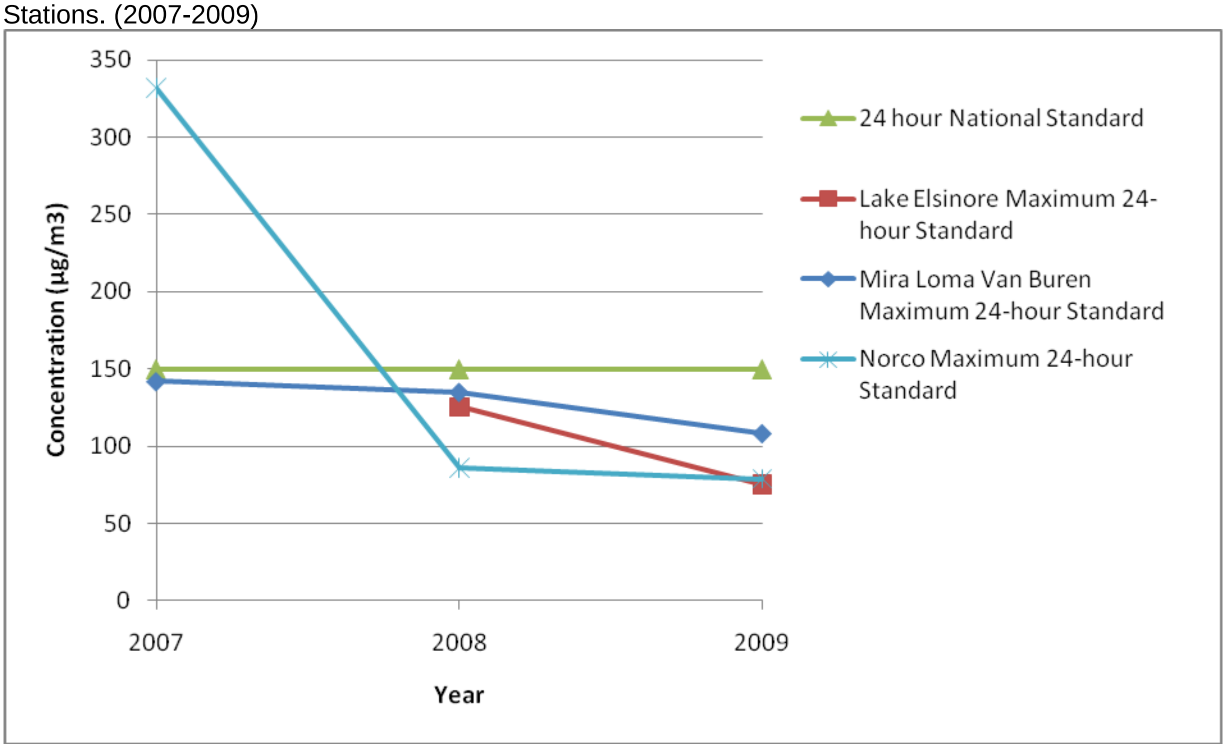
Table 3-3 Ambient PM10 Monitoring Data (µg/m^3) at the Lake Elsinore, Mira Loma Van Buren, and Norco Monitoring Stations (2007 through 2009)

	2007	**2008**	**2009**
Lake Elsinore			
Maximum 24-Hour Concentration	NA	125.4	75.2
Exceeds the federal 24-hour standard (150 µg/m^3)?	NA	No	No
Norco			
Maximum 24-Hour Concentration	332	86	79
Exceeds the federal 24-hour standard (150 µg/m^3)?	Yes	No	No
Mira Loma Van Buren			
Maximum 24-Hour Concentration	142	135	108
Exceeds the federal 24-hour standard (150 µg/m^3)?	No	No	No

Source: California Air Resources Board 2011, compiled by ICF International February 2011.

As indicated in Table 3-3 and Figure 3-6, maximum 24-hour PM10 concentrations at the Lake Elsinore monitoring station decreased from between 2008 (125.4 µg/m^3) and 2009 (75.2 µg/m^3) in 2009. These values have remained below the current national standard of 150 µg/m^3. At the Norco monitoring station, Table 3-3 and Figure 3-6 indicate that 24-hour PM10 concentrations have decreased from 332 µg/m^3 in 2007 to 79 µg/m^3 in 2009. The national 24 hour maximum measurement at the Norco station in 2007 is above the national standard due to wildfires and strong winds that occurred in the region (California Air Resources Board n.d.). The California Air Resources Board (ARB) has requested that 2007 data from the Norco monitoring station be excluded due to these exceptional events. It should be noted that the following year, 2008, at the Norco station, the maximum 24-hour PM10 concentration was measured at 86 µg/m^3, well below the standard of 150 µg/m^3. Table 3-3 and Figure 3-6 also indicate that 24-hour PM10 concentrations have decreased from 142 µg/m^3 in 2007 to 108 µg/m^3 in 2009 at the Mira Loma Van Buren Station.

Figure 3-6. PM10 24-hour Concentrations (µg/m^3) at the Mira Loma Van Buren, Lake Elisnore, and Norco Stations. (2007-2009)



Source: California Air Resources Board 2011, compiled by ICF International February 2011.

3.2.2.3 Surrounding Land Uses

The South Coast Air Quality Management District (SCAQMD) generally defines a sensitive receptor as a facility or land use that houses or attracts members of the population, such as children, the elderly, and people with illnesses, who are particularly sensitive to the effects of air pollutants.

Various sensitive receptors are located along the 43.5-mile project limits, and include residences, schools, playgrounds, child care facilities, athletic facilities, health care facilities, convalescent centers, or rehabilitation centers. Land use compatibility issues relative to the siting of pollution-emitting sources or the siting of sensitive receptors must be considered. In the case of schools, state law requires that siting decisions consider the potential for toxic or harmful air emissions in the surrounding area. The Northern section of the project vicinity, from SR-91 to the Northern end of the project corridor, is densely populated and contains a variety of sensitive receptors. The Southern section of the project vicinity is less densely populated than the Northern section.

3.2.2.4 Future Trends

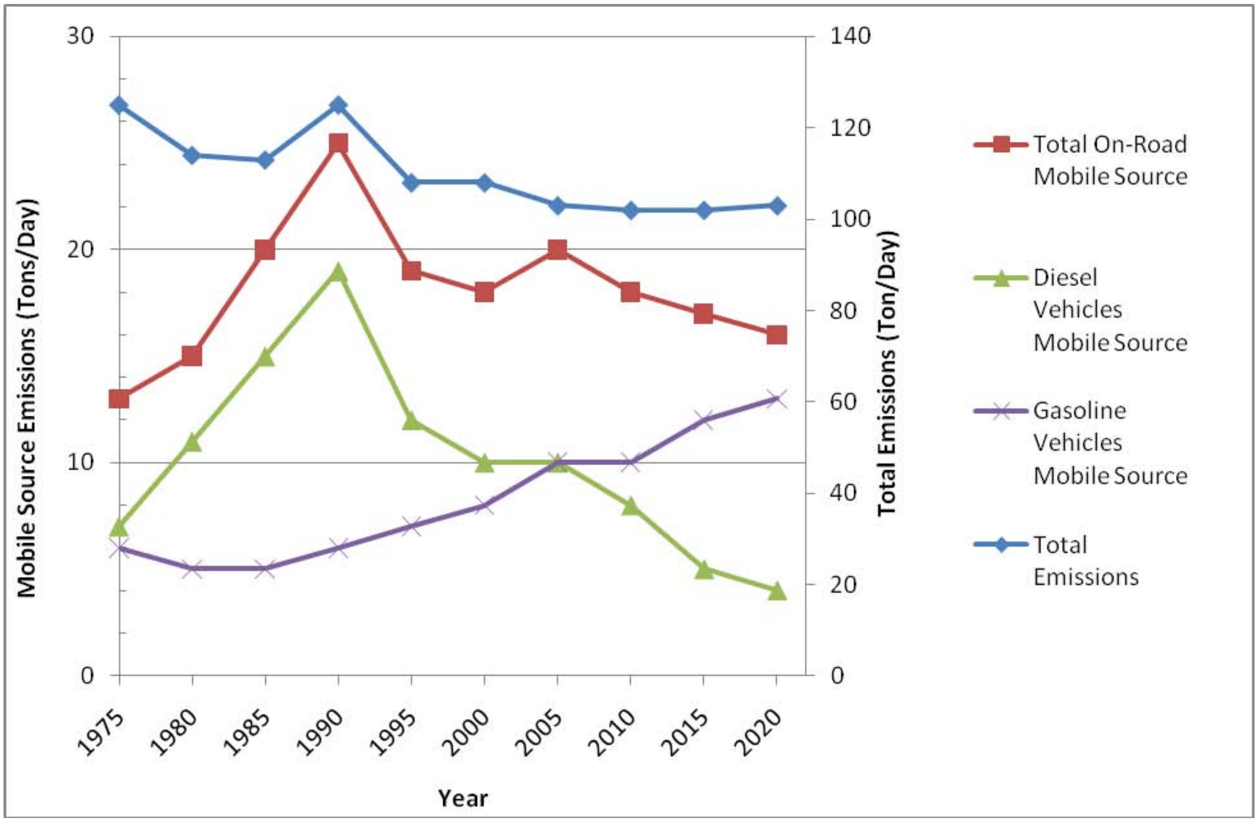
Emission trend data for the SCAB published in the 2009 edition of *The California Almanac of Emissions and Air Quality* published by the ARB was used to provide an estimate of potential PM2.5 and PM10 trends in the vicinity of the project area (California Air Resources Board 2009). While the ARB's Almanac does not provide emission trend data on the county level, the regional trend data can be used to provide insight on the general trends of air quality in the project area, as implementation of emission standards and control requirements that have an effect on regional pollutant concentrations are likely to result in similar trends at the local level.

Tables 3-4 and 3-5 and Figures 3-7 and 3-8 present emission trends in the SCAB for the years 1975-2020 based on ARB Almanac data (California Air Resources Board 2009). Total PM2.5 emissions, emissions from on-road gasoline vehicles, on-road diesel vehicles, and total on-road emissions are presented in Table 3-4 and Figure 3-7, while Table 3-5 and Figure 3-8 present the same emission trend categories for PM10.

Table 3-4. PM2.5 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	125	13	7	6
1980	114	15	11	5
1985	113	20	15	5
1990	125	25	19	6
1995	108	19	12	7
2000	108	18	10	8
2005	103	20	10	10
2010	102	18	8	10
2015	102	17	5	12
2020	103	16	4	13
Source: California Air Resources Board 2009				

Figure 3-7 PM2.5 Emission trends in South Coast Air Basin (tons per day)

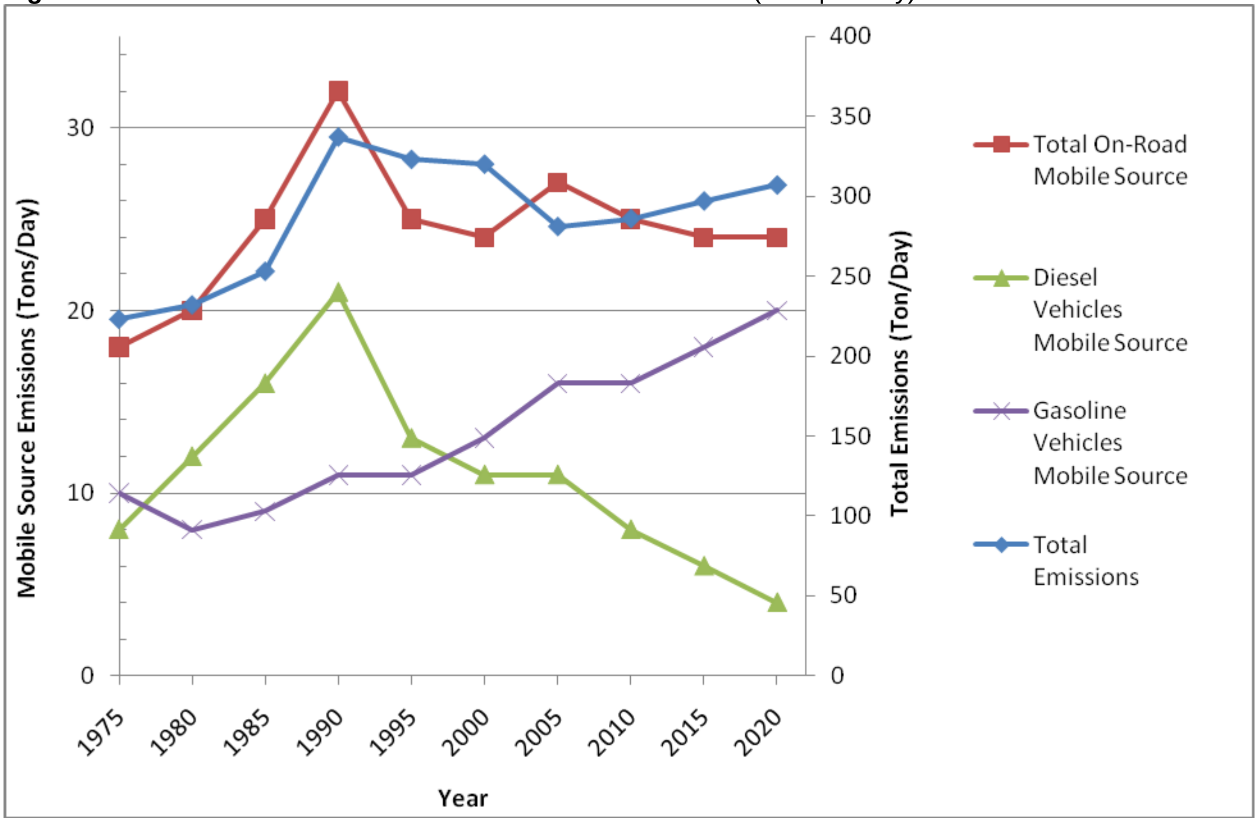


Source: California Air Resources Board 2009, compiled by ICF International February 2011.

Table 3-5. PM10 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	223	18	8	10
1980	232	20	12	8
1985	253	25	16	9
1990	337	32	21	11
1995	323	25	13	11
2000	320	24	11	13
2005	281	27	11	16
2010	286	25	8	16
2015	297	24	6	18
2020	307	24	4	20
Source: California Air Resources Board 2009				

Figure 3-8 PM10 Emission trends in the South Coast Air Basin (tons per day)



Source: California Air Resources Board 2009, compiled by ICF International February 2011

The emissions trends presented in Tables 3-4 and 3-5 and Figures 3-10 and 3-11 indicate that total on-road emissions are expected to maintain a decreasing trend through 2020, with increases in emissions from on-road gasoline vehicles offset by substantial decreases in emissions from on-road diesel vehicles. Emissions of directly emitted PM2.5 and PM10 from diesel motor vehicles have been decreasing since their peak levels in 1990 even though population and vehicles miles traveled (VMT) are increasing due to adoption of more stringent emission standards.

Tables 3-4 and 3-5 and Figures 3-7 and 3-8 indicate that total on-road PM2.5 and PM10 emissions increased between 1975 and 1990, the year in which emissions peaked (25 tons/day for PM2.5 and 32 tons/day for PM10). Total on-road emissions decreased between 1990 and 2000, increased in 2005, and are projected to show a decreasing trend through 2020.

3.2.3 Population and Traffic Growth

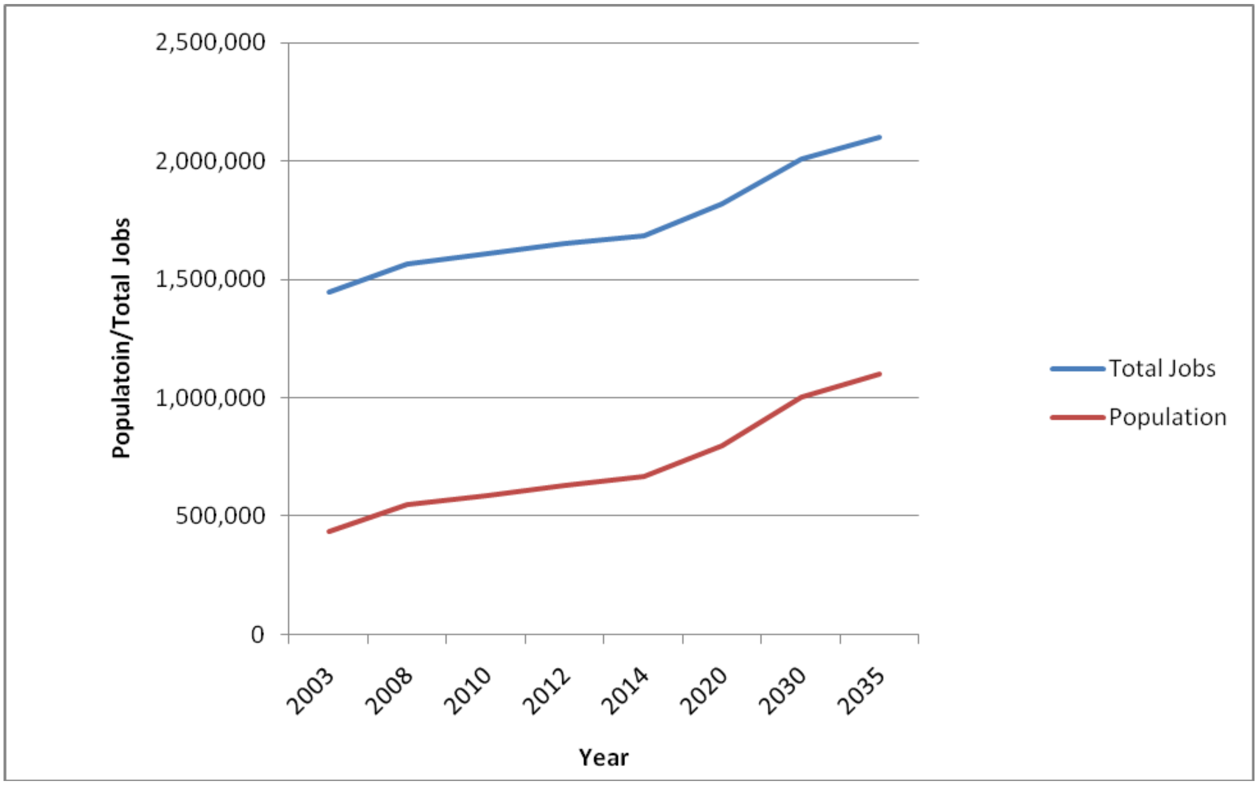
3.2.3.1 Regional Population Growth

As indicated in Tables 3-4 and 3-5 and Figures 3-7 and 3-8, total PM2.5 and PM10 emissions in the SCAB are projected to increase slightly through 2020, although total on-road emissions are expected to decrease through 2020. This trend is despite the fact that Riverside County population residing in the SCAB is anticipated to increase from 1,446,000 in 2003 to 1,818,000 in 2020 and jobs are anticipated to increase from 433,000 in 2003 to 797,000 in 2020, as indicated in Table 3-6 and Figure 3-9.

Table 3-6. SCAG Regional Population and Employment Projections for Riverside County

	2003	2008	2010	2012	2014	2020	2030	2035
Population	1,446,000	1,567,000	1,611,000	1,653,000	1,684,000	1,818,000	2,011,000	2,102,000
Total Jobs	433,000	547,000	588,000	629,000	670,000	797,000	1,005,000	1,098,000
Source: Southern California Association of Governments 2008								

Figure 3-9. SCAG Regional Population and Housing Projections



Source: Southern California Association of Governments 2008

3.2.3.2 Regional Traffic Growth

With population and employment growth expected to occur regionally (Table 3-6 and Figure 3-9), it is anticipated that this anticipated growth could result in increased traffic within the project area. Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineers, Iteris. (Greene pers. comm.). Iteris provided both peak and off-peak hour VMT data and VMT distribution by 5-mph speed bins[1] (5 mph to 75 mph). VMT data included vehicle activity for affected roadways in the immediate project area. The

[1] Traffic data are apportioned into separate 5 mph categories between the speeds of 5 to 75 mph. Each 5 mph category is known as a speed bin.

traffic data used for emissions modeling is summarized Appendix A. Data for the conditions have been evaluated for the following conditions:

1. project corridor;

2. the local project region (Western Riverside County); and

3. the larger project region (Western Riverside County to the Pacific Ocean)

Changes in total net emissions in PM are less pronounced in the local project region and larger project regionbut more substantial in the project corridor.. This is because the project corridor represents traffic traveling on the corridor only and does not analyze the effects of the project to other roadways. The local project region and larger project region analyze the effects of the project on a broader scope, showing congestion improvements which lead to smaller changes in net emissions over no build conditions. Tables A-1 through A-4 in Appendix A present project corridor VMT and VHT (Vehicle Hours Traveled) traffic data, with total traffic data presented in Tables A-1 and A-2 and truck data presented in Tables A-3 and A-4. Tables A-5 through A-8 in Appendix A present local project region VMT and VHT traffic data, with total traffic data presented in Tables A-5 and A-6 and truck data presented in Tables A-7 and A-8. Tables A-9 through A-12 in Appendix A present larger project region VMT and VHT traffic data, with total traffic data presented in Tables A-9 and A-10 and truck data presented in Tables A-11 and A-12.

Tables 3-7 through 3-9 present a summary comparison of VMT and average speed data associated with Alternatives 1 and 2 under both existing and future-year no-build conditions, with Table 3-7 presenting project corridor traffic data, Table 3-8 presenting local project region traffic data, and Table 3-9 presenting larger project region traffic data. The data from Tables 3-7 through 3-9 are summarized from the data found in Tables A-1 through A-12 in Appendix A and indicate that implementation of the build alternatives are expected to result in increases in VMT when compared to no build conditions. While the build conditions would increase VMT, average peak hour and nonpeak hour speeds are also increasing, which indicates that implementation of the project is causing improved traffic operations and overall system efficiency.

Tables 3-7 through 3-9 also indicate that VMT increases are highest under the project corridor condition (1,328,409 increase in VMT), followed by the local project region (738,294 increase in VMT), with the larger project region having the smallest increase in VMT (556,941 increase in VMT). The large VMT increases seen under the project corridor condition is because the project corridor condition only evaluates traffic directly on the expanded freeway and does not evaluate the increased network efficiency and congestion-relief effects of the project on other roadways in the area. The regional emissions analysis, which evaluates the effects of the project on roadways in the local project region, indicates that the project would result in increased network efficiency and reduced congestion on the immediate roadway network, with the most benefit seen under the largerproject region, which is likely the result of more roadways showing a benefit with increased network efficiency and congestion-relief resulting from the project, since it evaluates a larger area.

Table 3-7. Vehicle Miles Traveled and Average Speed Comparison by Alternative - Project Corridor

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	12,075,856	41.77	6,562,562	36.17	5,513,294	51.20	403,867	61.23	695,732	60.94
2020 No Build	15,431,038	39.01	8,329,783	33.07	7,101,255	49.43	563,673	60.85	963,602	60.41
2020 Alt 1	16,269,998	42.37	9,126,723	37.72	7,143,275	50.28	557,812	60.34	955,368	59.97
2020 Alt 2	16,328,299	42.42	9,114,797	37.67	7,213,502	50.44	562,756	60.88	961,982	60.41
2040 No Build	20,357,458	35.47	10,951,164	29.11	9,406,294	47.58	788,985	61.19	1,352,631	60.81
2040 Alt 1	21,685,867	38.70	12,049,965	33.10	9,635,902	49.09	773,733	60.53	1,327,389	60.13
2040 Alt 2	21,681,111	38.79	12,031,325	33.16	9,649,786	49.23	785,428	61.19	1,346,317	60.72
Comparison of VMT and Speed										
Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1 - Existing	4,194,142	0.60	2,564,161	1.55	1,629,981	-0.92	153,945	-0.89	259,636	-0.97
2020 Alt 2- Existing	-12,075,856	0.65	2,552,235	1.50	1,700,208	-0.76	158,889	0.00	266,250	-0.53
2040 Alt 1- Existing	9,610,011	-3.07	5,487,403	-3.07	4,122,608	-2.11	369,866	-0.70	631,657	-0.81
2040 Alt 2- Existing	9,605,255	-2.98	5,468,763	-3.01	4,136,492	-1.97	381,561	-0.04	650,585	-0.22
2020 Alt 1 - 2020 NB	-12,075,856	3.35	796,940	4.65	42,020	0.85	-5,861	-0.51	-8,234	-0.45
2020 Alt 2- 2020 NB	897,261	3.40	785,014	4.60	112,247	1.01	-917	0.03	-1,620	-0.01
2040 Alt 1- 2040 NB	1,328,409	3.23	1,098,801	3.99	229,608	1.51	-15,252	-0.66	-25,242	-0.68
2040 Alt 2 - 2040 NB	1,323,653	3.32	1,080,161	4.05	243,492	1.65	-3,557	0.00	-6,314	-0.09

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Table 3-8. Vehicle Miles Traveled and Average Speed Comparison by Alternative – Local Project Region (Western Riverside County)

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	44,260,055	36.07	24,479,239	30.76	19,780,816	45.88	1,457,252	59.87	2,518,308	59.27
2020 No Build	62,473,450	30.86	34,570,011	24.69	27,903,439	44.70	1,824,519	57.69	3,143,457	57.20
2020 Alt 1	62,780,699	31.97	34,869,362	25.98	27,911,337	44.93	1,823,845	57.52	3,142,498	57.06
2020 Alt 2	62,857,439	31.99	34,882,101	25.99	27,975,338	44.94	1,824,495	57.68	3,143,277	57.20
2040 No Build	86,062,844	24.40	47,473,731	18.09	38,589,113	42.74	2,442,964	57.84	4,212,207	57.62
2040 Alt 1	86,723,666	25.12	47,984,214	18.78	38,739,452	43.16	2,448,407	57.67	4,221,428	57.44
2040 Alt 2	86,801,138	25.21	48,063,114	18.88	38,738,024	43.20	2,450,856	57.92	4,225,329	57.64
Comparison of VMT and Speed										
Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1- Existing	18,520,644	-4.10	10,390,123	-4.78	8,130,521	-0.95	366,593	-2.35	624,190	-2.21
2020 Alt 2 - Existing	18,597,384	-4.08	10,402,862	-4.77	8,194,522	-0.94	367,243	-2.19	624,969	-2.07
2040 Alt 1 - Existing	42,463,611	-10.95	23,504,975	-11.98	18,958,636	-2.72	991,155	-2.20	1,703,120	-1.83
2040 Alt 2 - Existing	42,541,083	-10.86	23,583,875	-11.88	18,957,208	-2.68	993,604	-1.95	1,707,021	-1.63
2020 Alt 1- 2020 NB	307,249	1.11	299,351	1.28	7,898	0.23	-674	-0.17	-959	-0.14
2020 Alt 2 - 2020 NB	383,989	1.13	312,090	1.29	71,899	0.24	-24	0.00	-180	0.00
2040 Alt 1- 2040 NB	660,822	0.72	510,483	0.69	150,339	0.42	5,443	-0.17	9,221	-0.18
2040 Alt 2- 2040 NB	738,294	0.81	589,383	0.79	148,911	0.46	7,892	0.08	13,122	0.02

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Table 3-9. Vehicle Miles Traveled and Average Speed Comparison by Alternative – Larger Project Region (Western Riverside County to Pacific Ocean)

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
Existing	200,238,742	33.34	108,889,013	28.40	91,349,729	42.07	4,250,658	57.59	7,578,832	55.73
2020 No Build	239,539,853	31.39	129,403,605	25.99	110,136,248	41.53	4,773,952	56.75	8,507,535	55.09
2020 Alt 1	239,666,657	31.72	129,574,470	26.40	110,092,187	41.59	4,773,205	56.69	8,506,374	55.05
2020 Alt 2	239,753,660	31.70	129,561,694	26.38	110,191,966	41.55	4,773,990	56.75	8,507,474	55.09
2040 No Build	287,708,347	28.11	155,007,313	22.18	132,701,034	40.87	5,757,421	56.97	10,313,535	55.68
2040 Alt 1	288,186,312	28.44	155,401,667	22.54	132,784,645	41.00	5,761,115	56.90	10,319,551	55.61
2040 Alt 2	288,265,288	28.42	155,475,214	22.52	132,790,074	41.01	5,764,178	57.01	10,324,495	55.69

Comparison of VMT and Speed

Condition	Total		Peak		Off-Peak		Truck Peak		Truck Off-Peak	
	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed	VMT	Average Speed
2020 Alt 1- Existing	39,427,915	-1.62	20,685,457	-2.00	18,742,458	-0.48	522,547	-0.90	927,542	-0.68
2020 Alt 2 - Existing	39,514,918	-1.64	20,672,681	-2.01	18,842,237	-0.52	523,332	-0.84	928,642	-0.64
2040 Alt 1 - Existing	48,646,459	-4.90	46,512,654	-5.86	41,434,916	-1.08	1,510,457	-0.69	2,740,719	-0.11
2040 Alt 2 - Existing	48,598,631	-4.92	46,586,201	-5.88	41,440,345	-1.07	1,513,520	-0.58	2,745,663	-0.04
2020 Alt 1- 2020 NB	126,804	0.33	170,865	0.41	-44,061	0.06	-747	-0.07	-1,161	-0.05
2020 Alt 2 - 2020 NB	213,807	0.31	158,089	0.40	55,718	0.02	38	0.00	-61	0.00
2040 Alt 1- 2040 NB	477,965	0.33	394,354	0.36	83,611	0.13	3,694	-0.08	6,016	-0.07
2040 Alt 2- 2040 NB	556,941	0.32	467,901	0.34	89,040	0.14	6,757	0.04	10,960	0.01

(Iteris. Greene pers. comm., 2011, compiled by ICF, International March 2011)

Mainline Average Daily Traffic and Truck Volumes

Table 3-1 presents total and truck ADT volumes for the I-15 corridor in Riverside County. The project traffic engineers, Iteris provided truck percentage data as a function of VMT, which is presented in Tables A-1 through A-12 in Appendix A (Iteris. Greene pers. comm., 2011). The truck percentages from the provided VMT data in Appendix A were applied to the ADT volumes provided by Iteris to calculate total truck ADT for mainline I-15 presented in Table 3-1. Table 3-1 indicates that, relative to the no-build alternatives, total ADT is expected to increase under the build alternatives , with Alternative 1 having higher traffic volumes than Alternative 2. In addition, Table 3-1 also indicates that truck ADTis expected to decrease under the build alternatives within the project corridor and the local project region, with respect to no build alternatives. Within the larger project region, truck ADT remains constant throughout no-build and build alternatives in 2020, and it decreases slightly under the build alternatives relative to the no-build alternatives in 2040.

Roadway and Intersection Level of Service

Appendix B presents the following data:

Existing, 2020 no build, and 2040 no build alternatives

- mainline,
- ramp,
- weaving, and
- intersection LOS

Build Alternatives 1 and 2

- mainline,
- ramp,
- weaving,
- HOV/tolled lane,
- and intersection LOS

The data presented in Appendix B indicates that implementation of the project would generally improve system-wide operations in the vicinity project area.

Table 3-10 presents a summary of intersection volume and LOS/delay data from Appendix B and evaluates the total number of intersections experiencing changes in intersection volumes and LOS/delay between the build and no-build alternatives. Similarly, Table 3-11 presents a summary of mainline freeway segment speed and density data from Appendix B and evaluates the number of mainline freeway segments experiencing changes in speed and density between the build and no build alternatives. It should be noted that Table 3-10 and Table 3-11 do not present the magnitude of the actual changes in volumes, LOS/delay, speed, and density. Instead, Tables 3-10 and 3-11 only summarize the total number of intersections and segments that would experience these changes. Table 3-10 indicates that, in 2020, more intersections would experience improvements (decreases) in volumes than would experience worsened (increases) volumes increase for both AM and PM peak hour conditions. Table 3-10 also indicates that more intersections would experience improvements (decreases) in LOS/delay under AM peak hour condition, while more intersections would experience more worsened (increases) LOS/delay under PM peak hour conditions in 2020. However, under full buildout conditions in 2040, more intersections would experience improvements (decreases) in volumes and LOS/delay than would experience worsened (increases) volumes and LOS/delay. This indicates that the project would result in increased network efficiency and congestion-relief, likely leading to decreases in pollutant emissions.

Table 3-10. Summary of Changes in Intersection LOS/Delay between Build and No-build Alternatives

Condition		2020				2040			
		Delay decreases/improves	**Delay increases/worsens**	**Volumes decreases/improves**	**Volumes increase/worsen**	**Delay decreases/improves**	**Delay increases/worsens**	**Volumes decrease/improve**	**Volumes increase/worsen**
AM	Alternative 1	56	49	60	53	71	38	75	38
	Alternative 2	55	49	81	32	76	33	70	43
PM	Alternative 1	44	61	60	53	62	44	75	38
	Alternative 2	43	62	81	32	98	8	70	43

(Iteris. Greene pers. comm., compiled by ICF, International March 2011.)

Table 3-11. Summary of Changes in Mainline Freeway Segment Speed and Density between Build and No-build Alternatives

2020									
Condition		Southbound				Northbound			
		Speed decreases/worsens	**Speed increases/improves**	**Density increases/worsens**	**Density decreases/improves**	**Speed decreases/worsens**	**Speed increases/improves**	**Density increases/worsens**	**Density decreases/improves**
AM	Alternative 1	14	17	13	20	11	21	3	30
	Alternative 2	2	30	0	34	11	22	3	31
PM	Alternative 1	15	17	13	19	9	26	6	29
	Alternative 2	6	24	11	30	14	24	11	27
2040									
AM	Alternative 1	2	26	2	27	3	24	4	24
	Alternative 2	1	32	0	34	8	21	6	23
PM	Alternative 1	13	12	11	14	12	16	12	16
	Alternative 2	14	18	14	18	13	17	12	18

(Iteris. Greene pers. comm., compiled by ICF, International March 2011.)

Congestion Relief and System-Wide Improvements

The project would provide congestion relief and improve system-wide operations by improving traffic flow. The project would increase overall speeds during both the opening and horizon years (see Tables 3-7 through Tables 3-9). In 2020, Table 3-7 indicates that speeds would increase by approximately 3.4 mph relative to the no build alternative, while speeds would increase between 3.23 and 3.32 mph in 2040, relative to the no build alternative. Table 3-8 indicates that speeds in the local project region in 2020 would increase approximately 1.1 mph relative to the no build alternative, while speeds would increase between 0.72 and 0.81 mph in 2040, relative to the no build alternative. As shown in Table 3-9, speeds in the larger project region in 2020 would increase by up to 0.33 mph relative to the no build alternative, while speeds in 2040 would increase by 0.33 mph as well, relative to the no build alternative.

PM emissions typically follow a U-shaped curve relative to speed, with highest emissions observed at the lowest and highest speeds. Typically, emissions are typically higher at the lowest speeds and tend to decrease as speeds increase to the most efficient/ lowest emission speed of around 45 mph. As speeds increase from 45 mph upward, emissions tend to increase as speeds increase. Thus, 45 mph, the speed at which emissions are at a minimum, is the approximate target speed for reducing PM emissions. Tables 3-7 through 3-9 show that speeds associated with total VMT are increasing towards the ideal emissions speed of 45 miles per hour under build conditions. Because speeds under opening (2020) and horizon-year (2040) no build conditions are well below 45 miles per hour (i.e, higher), the increases in speeds (Tables 3-7 through 3-9) due to the project results in an improvement in PM emissions. As shown in table 3-11, a majority of mainline freeway segments will experience improvements (increases) in roadway speeds and density/congestion (decreases) relative to the no build scenario, except for the situation of southbound segments for Alternative 1 in the PM peak hour. In this scenario, more segments will experience worsened (decreases) speeds than would show improvements (increases) in speeds. For all other scenarios, the number of segments experiencing improved conditions (increases in speeds and decreases in density/congestion) outnumber the number of segments experiencing worsened conditions.

3.2.4 Traffic Emissions Analysis

The project traffic engineers (Iteris) calculated daily VMT, VHT, and speed data (Table 3-7 through Table 3-9, and Appendix A), as well as vehicle LOS and delay for vehicle trips along the I-15 corridor, within the local project region (Western Riverside County), and larger project region (Western Riverside County to the Pacific Ocean) as shown in Appendix B. The Department's CT-EMFAC model[2] was used to calculate PM10 and PM2.5 exhaust, tire wear, and brake wear emissions for each of the project alternatives and analysis years. Emissions estimates are included below in Table 3-12 through Table 3-14. The CT-EMFAC program assumed a SCAB vehicle fleet mix, adjusted for project-specific truck fleet percentages (Table 3-

[2] CT-EMFAC is a California-specific project-level analysis tool for modeling criteria pollutant and carbon dioxide emissions from on-road mobile sources. The model uses the latest version of the California Mobile Source Emission Inventory and Emission Factors model, EMFAC2007. While regulations and emissions controls adopted after 2007 are not reflected in the model emission factors, CT-EMFAC is the latest on-road emissions modeling tool and is used as standard practice in air quality technical analyses.

1), operating under annual-average conditions. Vehicle fleet mixes were based on visual traffic counts by the traffic engineer (Iteris 2010), and MSAT speciation factors were based on ARB factors.

3.2.4.1 Re-entrained Road Dust Analysis

The CT-EMFAC model does not estimate re-entrained road dust emissions. Therefore, re-entrained road dust emissions were calculated using the empirical equation found in Section 13.2.1 of the EPA's *AP-42 Compilation of Air Pollutant Emission Factors*, which was updated in January 2011. Emissions were calculated using VMT traffic data supplied by the traffic engineers (Appendix A) and the emission factor as calculated using the empirical road dust equation. Variables to calculate road dust emissions were taken from traffic data (VMT and vehicle weight) and from nearby climate stations (precipitation). As previously indicated, PM10 re-entrained road dust emissions are considered based on the EPA's final transportation conformity rule, while PM2.5 re-entrained road dust emissions are evaluated because the ARB has determined that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the project area. The EPA published updated guidance in their AP-42 Compilation of Air Pollutant Emission Factors in January 2011 for evaluating re-entrained road dust for SIP development and conformity purposes. Therefore, the analysis of re-entrained road dust emissions uses emission factors from the January 2011 update to AP-42 Section 13.2.1. Calculated PM10 and PM2.5 re-entrained road dust emissions are presented in Tables 3-12 through 3-14.

Table 3-12 summarizes the modeled daily emissions resulting from exhaust, brake and tire wear, and re-entrained road dust for the project corridor, Table 3-13 presents emissions for the localproject region (Western Riverside County), and Table 3-14 presents emissions for the larger project region (Western Riverside County extending west to the Pacific Ocean). Emissions associated with implementation of the proposed project were obtained by comparing future Build Alternative emissions to future No Build emissions for both 2020 and 2040. The differences in emissions between build Alternative and no build alternativerepresent emissions generated directly as a result of implementation of the build alternatives.

As indicated in Table 3-12, total PM10 and PM2.5 emissions would increase slightly along the project corridor, with PM10 emissions increasing by up to 3.14% in 2020 and 2.94% in 2040, while PM2.5 emissions would increase by up to 3.50% in 2020 and 2.87% in 2040. The project corridor condition analyzed in Table 3-12 only evaluates traffic operating directly on the I-15 corridor and does not evaluate traffic on other roadways or the effects of the project on other local roadways in the vicinity of the project area (i.e., trip redistribution and congestion relief on other roadways).

While Table 3-12 indicates that emissions would increase slightly along the project corridor, Table 3-13, which evaluates project emissions in the local project region and takes into account the effects of the project corridor on other roadways in the local project region (i.e., the effects of the project on regional trip distribution and congestion on the roadway network in the region), indicates that total project-related PM10 emissions will have a negligible increase (less than

0.13% in 2020 and 0.36% in 2040), while PM2.5 emissions are expected to decrease by up to 0.32% in 2020 and 0.36% in 2040.

Table 3-12. I-15 Project-Related Particulate Emissions for the Project Corridor (pounds per day)

Scenario	PM10			PM2.5		
	Exhaust/ Brake/ Tire Wear	Road Dust	Total	Exhaust/ Brake/ Tire Wear	Road Dust	Total
Existing (2007)	655	2,121	2,776	598	521	1,119
2020 No build	670	2,819	3,488	620	692	1,312
2020 Alternative 1	688	2,886	3,574	638	708	1,347
2020 Alternative 2	696	2,902	3,598	646	712	1,358
2040 No build	855	3,831	4,686	803	940	1,743
2040 Alternative 1	868	3,921	4,789	818	962	1,780
2040 Alternative 2	876	3,948	4,824	824	969	1,793
Comparison of Emissions between Build Alternatives and Existing Conditions, Project Corridor						
2020 Alternative 1 - Existing	33	765	798	40	187	228
2020 Alternative 2 - Existing	41	781	822	48	191	239
2040 Alternative 1 - Existing	213	1,800	2,013	220	441	661
2040 Alternative 2 - Existing	221	1,827	2,048	226	448	674
Comparison of Emissions (Percent Change)between Build Alternatives and Existing Conditions, Project Corridor						
2020 Alternative 1 - Existing	5.10%	36.06%	28.75%	6.73%	35.96%	20.34%
2020 Alternative 2 - Existing	6.29%	36.80%	29.60%	8.03%	36.70%	21.38%
2040 Alternative 1 - Existing	32.52%	84.87%	72.51%	36.79%	84.64%	59.07%
2040 Alternative 2 - Existing	33.74%	86.14%	73.78%	37.79%	85.99%	60.23%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Project Corridor						
2020 Alt 1 – 2020 No Build	19	67	86	18	16	34
2020 Alt 2 -– 2020 No Build	27	83	110	26	20	46
2040 Alt 1 – 2040 No Build	13	90	103	15	22	37
2040 Alt 2 – 2040 No Build	21	117	138	21	29	50
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Project Corridor						
2020 Alt 1 – 2020 No Build	2.81%	2.38%	2.46%	2.86%	2.38%	2.61%
2020 Alt 2 -– 2020 No Build	3.98%	2.94%	3.14%	4.11%	2.94%	3.50%
2040 Alt 1 – 2040 No Build	1.52%	2.35%	2.20%	1.87%	2.34%	2.12%
2040 Alt 2 – 2040 No Build	2.46%	3.05%	2.94%	2.62%	3.09%	2.87%

Table 3-13. I-15 Project-Related Particulate Emissions for the Local Project Region (Western Riverside County) (pounds per day)

	PM10			PM2.5		
Scenario	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**
Existing (2007)	2,378	7,726	10,104	2,167	1,896	4,063
2020 No build	2,819	10,335	13,154	2,604	2,537	5,141
2020 Alternative 1	2,793	10,363	13,155	2,581	2,544	5,124
2020 Alternative 2	2,800	10,371	13,171	2,588	2,546	5,134
2040 No build	4,018	14,070	18,088	3,776	3,454	7,230
2040 Alternative 1	3,967	14,146	18,113	3,732	3,472	7,204
2040 Alternative 2	3,994	14,159	18,153	3,755	3,475	7,230
Comparison of Emissions between Build Alternatives and Existing Conditions, Region, Local Project Region						
2020 Alternative 1 - Existing	415	2,637	3,051	414	648	1,061
2020 Alternative 2 - Existing	422	2,645	3,067	421	650	1,071
2040 Alternative 1 - Existing	1,589	6,420	8,009	1,565	1,576	3,141
2040 Alternative 2 - Existing	1,616	6,433	8,049	1,588	1,579	3,167
Comparison of Emissions (Percent Change) between Build Alternatives and Existing Conditions, Local Project Region						
2020 Alternative 1 - Existing	17.44%	34.13%	30.20%	19.10%	34.15%	26.13%
2020 Alternative 2 - Existing	17.75%	34.24%	30.36%	19.44%	34.27%	26.36%
2040 Alternative 1 - Existing	66.82%	83.10%	79.27%	72.22%	83.12%	77.31%
2040 Alternative 2 - Existing	67.96%	83.26%	79.66%	73.28%	83.28%	77.95%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Local Project Region						
2020 Alt 1 – 2020 No Build	-26	28	2	-23	7	-16
2020 Alt 2 -– 2020 No Build	-19	36	18	-16	9	-7
2040 Alt 1 – 2040 No Build	-51	76	25	-44	18	-26
2040 Alt 2 – 2040 No Build	-24	89	65	-21	21	0
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Local Project Region						
2020 Alt 1 – 2020 No Build	-0.92%	0.27%	0.01%	-0.89%	0.27%	-0.32%
2020 Alt 2 -– 2020 No Build	-0.66%	0.35%	0.13%	-0.60%	0.35%	-0.13%
2040 Alt 1 – 2040 No Build	-1.27%	0.54%	0.14%	-1.17%	0.52%	-0.36%
2040 Alt 2 – 2040 No Build	-0.60%	0.63%	0.36%	-0.56%	0.61%	0.00%

Table 3-14. I-15 Project-Related Particulate Emissions for the Larger Project Region (Western Riverside County to Pacific Ocean) (pounds per day)

Scenario	PM10			PM2.5		
	Exhaust/ Brake/ Tire Wear	**Road Dust**	**Total**	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**
Existing (2007)	9,459	29,506	38,965	8,624	7,242	15,867
2020 No build	10,151	34,529	44,680	9,391	8,475	17,866
2020 Alternative 1	10,113	34,539	44,653	9,357	8,478	17,835
2020 Alternative 2	10,118	34,549	44,667	9,361	8,480	17,842
2040 No build	12,385	41,577	53,962	11,666	10,205	21,872
2040 Alternative 1	12,319	41,631	53,950	11,607	10,219	21,825
2040 Alternative 2	12,345	41,646	53,991	11,629	10,222	21,852
Comparison of Emissions between Build Alternatives and Existing Conditions, Region, Larger Project Region						
2020 Alternative 1 - Existing	655	5034	5688	733	1236	1968
2020 Alternative 2 - Existing	659	5,043	5,703	737	1,238	1,975
2040 Alternative 1 - Existing	2,860	12,125	14,985	2,982	2,976	5,958
2040 Alternative 2 - Existing	2,886	12,140	15,026	3,005	2,980	5,985
Comparison of Emissions (Percent Change) between Build Alternatives and Existing Conditions, Larger Project Region						
2020 Alternative 1 - Existing	6.92%	17.06%	14.60%	8.50%	17.06%	12.40%
2020 Alternative 2 - Existing	6.97%	17.09%	14.64%	8.54%	17.09%	12.45%
2040 Alternative 1 - Existing	30.23%	41.09%	38.46%	34.58%	41.09%	37.55%
2040 Alternative 2 - Existing	30.51%	41.14%	38.56%	34.84%	41.14%	37.72%
Comparison of Emissions between Build Alternatives and No-Build Conditions, Larger Project Region						
2020 Alt 1 – 2020 No Build	-38	10	-27	-34	3	-32
2020 Alt 2 -– 2020 No Build	-33	20	-13	-30	5	-25
2040 Alt 1 – 2040 No Build	-66	54	-12	-60	13	-47
2040 Alt 2 – 2040 No Build	-40	69	29	-37	17	-20
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions, Larger Project Region						
2020 Alt 1 – 2020 No Build	-0.37%	0.03%	-0.06%	-0.36%	0.03%	-0.18%
2020 Alt 2 -– 2020 No Build	-0.33%	0.06%	-0.03%	-0.32%	0.06%	-0.14%
2040 Alt 1 – 2040 No Build	-0.54%	0.13%	-0.02%	-0.51%	0.13%	-0.21%
2040 Alt 2 – 2040 No Build	-0.32%	0.17%	0.05%	-0.32%	0.17%	-0.09%

While Table 3-13 evaluates emission in the local project region (Western Riverside County), Table 3-14 evaluates emissions within the larger project region (Western Riverside County to the Pacific Ocean) to evaluate the effects of the project corridor on other roadways in the larger project region. In 2020, the larger project region is projected to see decreases in PM10 emissions by up to .06%, while emissions could decrease by 0.02% for Alternative 1 and increase slightly by up to 0.05% for Alternative 2 in 2040. For PM2.5, emissions are anticipated to decrease by up to 0.18% in 2020 and up to 0.21% in 2040.

It should be noted that Tables 3-13 and 3-14 both show overall decreases in exhaust-related emissions and increases in re-entrained road dust emissions. So, while VMT is increasing, exhaust emissions are decreasing due to improvements in roadway congestion, travel speeds, and network efficiency. The observed increase in re-entrained road dust emissions is attributed to the overall increase in VMT, as emissions of re-entrained road dust is a function of VMT. Because VMT is expected to increase in the regional analyses, re-entrained road dust emissions increases exceed the decreases in exhaust, break, and tire wear emissions, resulting in a net increase in emissions over no build conditions.

3.3 Conclusion

Within the project corridor, emissions of PM2.5 and PM10 are expected to increase for both alternatives in the range of 2-3.5% from no build conditions. Because the project corridor condition only evaluates traffic directly on the expanded freeway and does not evaluate the increased network efficiency and congestion-relief effects of the project on other roadways in the area, emission increases seen under the project corridor condition are due primarily to the increased VMT traveling directly on the expanded freeway (the project corridor condition would result in a VMT increase of up to 1,328,409 VMT when compared to the no build condition), leading to increased exhaust and re-entrained road dust emissions (Table 3-12). However, the local regional emissions analysis, which evaluates the effects of the project on roadways in the local project region, indicates that the project would result in increased network efficiency and reduced congestion on the immediate roadway network. The local regional condition would result in a VMT increase of up to 738,294 VMT when compared to the no build condition. The emissions analysis indicates that emissions of PM2.5 and PM10 would either increase negligibly (PM10) or decrease (PM2.5) relative to no build conditions (Table 3-13). The emissions modeling further indicates that exhaust emissions would decrease under all conditions and alternatives, and that the negligible PM10 increase is directly attributable to re-entrained road dust from the increase in VMT slightly offsetting exhaust emission reductions. The larger project regional emissions analysis (Table 3-14) indicates that decreases in PM10 and PM2.5 emissions are expected in 2020. In 2040, PM10 emissions would increase slightly under Alternative 2, as a result of re-entrained dust from increased VMT, while PM10 emissions under Alternative 1 would show a net decrease. For PM2.5, Table 3-14 indicates that total emissions would decrease under both Alternatives. This is likely the result of more roadways showing a benefit with increased network efficiency and congestion-relief resulting from the project (the larger regional condition would result in a VMT increase of up to 556,941 VMT when compared to the no build condition).

Transportation conformity is required under CAA section 176(c) (42 U.S.C. 7506(c)) and requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS. As required by Final EPA rule published on March 10, 2006, this qualitative assessment demonstrates that the I-15 Corridor Improvement Project meets the CAA conformity requirements and will not conflict with state and local measures to improve regional air quality.

Implementation of the proposed project will not result in new violations of the federal PM2.5 or PM10 air quality standards for the following reasons:

- Based on representative monitoring data, ambient PM2.5 are on a decreasing trend (see Figures 3-4 and 3-5). Ambient PM10 concentrations are following a decreasing trend as well. (see Figure 3-6)
- Based on representative monitoring data, PM10 24-hour concentrations have not exceeded the national standard, 150 $\mu g/m^3$, in the past two years. It should be noted that the exceedence of national standards in 2007 was due to wildfires and strong winds in the region; thus, the national 24 hour maximum value for Norco in 2007 is not a characteristic measurement (California Air Resources Board n.d.), and the decreasing trend at the station in 2008 through 2009 should be seen as characteristic.
- While the Mira Loma Van Buren and Lake Elsinore monitoring stations have experienced exceedences of the federal PM2.5 NAAQS, representative monitoring data indicates that PM2.5 concentration have decreased over the past three years, is nearing the national standards, and concentrations should be below the annual average PM2.5 standard if the trend continues.
- In general, construction of the build alternative would result in improved level of service in the local project region as a whole, as the project increases efficiency of the roadway, resulting in improvements in regional emissions.
- Construction of the build alternative would result in improvement to overall speeds in the project corridor, local project region and larger project during both the opening and horizon years, resulting in improvements in regional emissions.
- Total project-related emissions within the larger project region (Western Riverside County to Pacific Ocean) would show a net decrease, relative to no build alternatives under future build alternatives (2020 and 2040), except under Alternative 2 in 2040, which would see a minor 0.05% increase in PM10 emissions, indicating that any increases in PM emissions due to the project, if any, will be minimal. (Table 3-14). This, taken in conjunction with the decreasing emissions trends in on-road PM emissions indicates that the project would not increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS.
- Implementation of the proposed project would decrease diesel truck percentages under build alternatives relative to no-build alternatives within the project corridor and the local project

region. Within the larger project region, diesel truck percentages remain constant in 2020 and decrease in 2040, over no build alternatives. (Table 3-1).

For these reasons, future or worsened PM2.5 or PM10 violations of any standards are not anticipated. Therefore, the proposed I-15 Corridor Improvement Project meets the conformity hot spot requirements in 40 CFR 93.116 and 93.126 for PM10 and PM2.5.

Chapter 4 References Cited

4.1 Printed References

California Air Resources Board 2009. The California Almanac of Emissions and Air Quality - 2009 Edition, Chapter 4 Air Basin Trends and Forecasts- Criteria Pollutants. Pgs.4-10 and 4-11. Last Revised March 27,2009. Available at <http://www.arb.ca.gov/aqd/almanac/almanac09/pdf/chap409.pdf>. Accessed February 17, 2011.

California Air Resources Board 2011. Top 4 Measurements and Days Above the Standard. Available at: <http:// http://www.arb.ca.gov/adam/welcome.html>. Accessed: January 24, 2011.

California Air Resources Board. nd . PM2.5 and PM10 Natural Event Document: Southern California High Winds and Wildfires October/November 2007. Last Revised: n.d. Available at <http://www.arb.ca.gov/desig/excevents/2007ned_draft.pdf>. Accessed March 7, 2011.

South Coast Air Quality Management District 2003. Final 2003 Air Quality Management Plan. August 2003. Diamond Bar, CA.

South Coast Air Quality Management District 2007. Final 2007 Air Quality Management Plan. June 2007. Diamond Bar, CA.

South Coast Air Quality Management District 2009a. Table 1: File Names and Corresponding City Names. Last Revised: May 21, 2009. Available at <http://www.aqmd.gov/smog/metdata/ISCST3_Table1.html>. Accessed February 16, 2011.

South Coast Air Quality Management District 2009b. Table 1 Meteorological Sites. Last Revised: May 27, 2009. Available at <http://www.aqmd.gov/smog/metdata/AERMOD_Table1.html>. Accessed February 16, 2011

Southern California Association of Governments 2008. 2008 Regional Transportation Plan: Making the Connections, Transportation Conformity Report. Pgs. 13 and 14. Last Revised: May 8, 2008. Available at <http://www.scag.ca.gov/rtp2008/pdfs/finalrtp/reports/fConformity.pdf>. Accessed February 17, 2011.

4.2 Personal Communications

Greene, Steven. Associate Vice President. Iteris, Inc. Los Angeles, CA. December 16, 2010—email.